NOTICE OF AVAILABILITY

Draft Environmental Impact Report

Date: April 27, 2015

To: Responsible and Trustee Agencies and Interested Parties

Lead Agency: Rosedale-Rio Bravo Water Storage District

Project Title: Stockdale Integrated Banking Project (SCH No. 2013091076)

Review Period: April 28, 2015 through June 12, 2015

Project Description: This Notice of Availability (NOA) has been prepared to notify agencies and interested parties that the Rosedale-Rio Bravo Water Storage District (Rosedale) as the Lead Agency, in consultation with the Irvine Ranch Water District (IRWD) as a Responsible Agency, has prepared a Draft Environmental Impact Report (Draft EIR) to provide the public and trustee agencies with information about the potential effects on the local and regional environment associated with the proposed Stockdale Integrated Banking Project (proposed project). The proposed project would allow both agencies to utilize available storage in the local San Joaquin Valley Groundwater Basin by developing groundwater banking facilities on up to three project sites located approximately six miles west of the City of Bakersfield in Kern County. The proposed project would include the Stockdale East property, which is owned by Rosedale, the Stockdale West property, which is owned by IRWD, and a potential third project site that would be located within a designated radius around both properties (collectively referred to as the "Stockdale Properties"). The proposed project would also include a new Central Intake Pipeline conveyance system and new turnouts along the Cross Valley Canal. Operation of the proposed project would be coordinated with Rosedale's existing Groundwater Storage, Banking, Exchange, Extraction & Conjunctive Use Program (Conjunctive Use Program) and the existing Rosedale-IRWD Strand Ranch Integrated Banking Project (Strand Ranch Project). The proposed project would provide greater operational flexibility for Rosedale and would enhance water supply reliability for IRWD by providing contingency storage to augment supplies during periods when other supply sources may be limited or not available.

Potential Environmental Impacts: This Draft EIR describes the potential direct, indirect, and cumulative environmental impacts of the proposed project. Mitigation measures have been incorporated to avoid or minimize impacts to less than significant levels. No potentially significant effects have identified that cannot be mitigated. There are no hazardous waste sites enumerated under Government Code 65962.5 within the project boundary.

Public Review and Comments: Rosedale and IRWD are soliciting comments from the public regarding the content of the Draft EIR prepared for the proposed project. The Draft EIR will be used by Rosedale and IRWD when considering approval of the proposed project. Pursuant to Section 21091 of the Public Resources Code, Rosedale has established a 45-day review period that begins April 28, 2015 and ends June 12, 2015. Written comments on the Draft EIR should be sent to Eric Averett at the address shown below. A contact name and return address or email address should be included with your comments.

Eric Averett, General Manager
Rosedale-Rio Bravo Water Storage District
P.O. Box 20820
Bakersfield, CA 93390-0820
(661) 589-6045
eaverett@rrbwsd.com

Document Availability: Copies of the Draft EIR are available for public review during regular business hours at the locations listed below:

- Rosedale-Rio Bravo Water Storage District Web Site (http://www.rrbwsd.com)
- Irvine Ranch Water District Web Site (http://www.irwd.com)
- Beale Memorial Library, 701 Truxton Ave, Bakersfield CA 93301
- Heritage Park Regional Library, 14361 Yale Ave, Irvine CA 92604

Public Meetings: Two public meetings will be held to receive comments regarding the scope, content, and analysis provided in the Draft EIR. The meeting will include a brief presentation providing an overview of the proposed project and conclusions of the Draft EIR. There are no significant and unavoidable impacts associated with the proposed project. After the presentation, oral comments will be accepted. Written comment forms will be supplied for those who wish to submit comments in writing at the public meeting; written comments may also be submitted anytime during the 45-day Draft EIR review period. The Draft EIR will be available for public review through June 12, 2015. The public meetings will be held as follows:

	Rosedale-Rio Bravo Water Storage District	**Irvine Ranch Water District**
DATE:	May 12, 2015	May 13, 2015
TIME:	11:00 AM	6:00 PM
LOCATION:	849 Allen Road Bakersfield, California	15600 Sand Canyon Avenue Irvine, California

POSTED

APR 28 2015

HUGH NGUYEN, CLERK-RECORDER

BY: _____ DEPUTY

STOCKDALE INTEGRATED BANKING PROJECT

Draft Environmental Impact Report
SCH #: 2013091076

Prepared for
Rosedale-Rio Bravo
Water Storage District and
Irvine Ranch Water District

April 2015

ESA

STOCKDALE INTEGRATED BANKING PROJECT

Draft Environmental Impact Report
SCH #: 2013091076

Prepared for
Rosedale-Rio Bravo
Water Storage District and
Irvine Ranch Water District

April 2015

626 Wilshire Boulevard
Suite 1100
Los Angeles, CA 90017
213.599.4300
www.esassoc.com

Oakland

Orlando

Palm Springs

Petaluma

Portland

Sacramento

San Diego

San Francisco

Santa Cruz

Seattle

Tampa

Woodland Hills

211181

TABLE OF CONTENTS

Stockdale Integrated Banking Project
Draft Environmental Impact Report

Page

Summary S-1

1. Introduction and Project Background 1-1
Introduction 1-1
1.1 Purpose of the EIR 1-1
1.2 Project-level and Program-level Analyses in this Draft EIR 1-2
1.3 Organization of this EIR 1-5
1.4 CEQA Process 1-5
1.5 Project Background and Context 1-9

2. Project Description 2-1
2.1 Overview and Project Location 2-1
2.2 Project Objectives 2-3
2.3 Purpose and Need for the Project 2-3
2.4 Description of Proposed Project 2-4
2.5 Project Construction 2-17
2.6 Project Operation 2-21
2.7 Maintenance 2-24
2.8 Project Approvals 2-24

3. Environmental Setting, Impacts, and Mitigation Measures 3-1
3.1 Aesthetics 3.1-1
3.2 Agriculture and Forestry Resources 3.2-1
3.3 Air Quality 3.3-1
3.4 Biological Resources 3.4-1
3.5 Cultural Resources 3.5-1
3.6 Geology, Soils, and Seismicity 3.6-1
3.7 Greenhouse Gas Emissions 3.7-1
3.8 Hazards and Hazardous Materials 3.8-1
3.9 Hydrology and Water Quality 3.9-1
3.10 Land Use and Planning 3.10-1
3.11 Mineral Resources 3.11-1
3.12 Noise 3.12-1
3.13 Transportation and Traffic 3.13-1
3.14 Utilities and Energy 3.14-1

4. Cumulative Impacts 4-1
4.1 Introduction 4-1
4.2 Related Projects 4-1
4.3 Impacts and Mitigation Measures 4-10

Page

5. Growth Inducement Potential 5-1
5.1 Overview 5-1
5.2 Population 5-1
5.3 Water Supply and Demand 5-3
5.4 Growth Inducement Potential 5-6

6. Alternatives Analysis 6-1
6.1 CEQA Requirements for Alternatives Analysis 6-1
6.2 Alternatives to the Project 6-2
6.3 Summary of Alternatives Analysis 6-8

7. Report Preparers 7-1
7.1 Project Sponsor / Lead Agency 7-1
7.2 Project Sponsor / Responsible Agency 7-1
7.3 EIR Authors and Consultants 7-1

Appendices

A Scoping Report
B1 Memorandum of Understanding Groundwater Banking Program
B2 Memorandum of Understanding Groundwater Banking and Sale Program
B3 Long Term Project Recovery Operations Plan
B4 Interim Project Recovery Operations Plan
C Air Quality URBEMIS Output Data Sheets
D1 Biological Technical Report
D2 Kit Fox Minimization Measures
E Analysis of Potential Groundwater Level Changes from Recharge and Recovery at the Stockdale West and Stockdale East Facilities
F Cross Valley Canal Operating Guidelines during Shallow Groundwater
G LESA Model and Manual
H Stockdale Integrated Banking Project – Potential Impacts of Groundwater Level Changes on Abandoned Oil Wells

Figures

1-1 Regional Location 1-3
1-2 Rosedale Existing Water Banking Facilities 1-11
1-3 Irvine Ranch Water District - Service Area 1-16
2-1 Project Location 2-2
2-2 Proposed Project Facilities 2-7
2-3 Typical Wellhead Facilities 2-11
2-4 Central Intake Pipeline 2-13
2-5 Stockdale West Turnout 2-16
2-6 Construction of Recharge Basins 2-18
2-7 Examples of Basin Transfer Structures 2-19
3.1-1 Site Photos 3.1-2
3.2-1 Designated Farmland in the Project Vicinity 3.2-2
3.4-1 Project Area Vegetation 3.4-5
3.4-2 CNDDB Records within 3 miles of Project Site 3.4-9

Page

Figures (cont.)

3.6-1 Geology of the San Joaquin Valley 3.6-2
3.6-2 Regional Geologic Faults 3.6-4
3.9-1 Kern County Water Districts 3.9-6
3.9-2 Hydrographs - Nested Monitoring Wells 3.9-10
3.9-3 Scenario 1: Predicted Groundwater Mounding Relative to the Cross Valley Canal Shallow/Intermediate Aquifers 3.9-28
3.10-1 General Plan Land Use Designation 3.10-2
3.10-2 Kern County Zoning Designation 3.10-4
3.10-3 Habitat Conservation Planning Designation 3.10-5
3.13-1 Regional Roadways 3.13-2
4-1 Kern County Water Districts 4-3

Tables

S-1 Summary of Project Impacts and Mitigation Measures S-9
3.3-1 Air Quality Data Summary (2010-2012) 3.3-3
3.3-2 State and National Criteria Air Pollutant Standards, Effects, and Sources 3.3-7
3.3-3 San Joaquin Valley Attainment Status 3.3-8
3.3-4 Unmitigated Project Construction Emissions (Tons per Year) 3.3-16
3.3-5 Project Operational Emissions (Tons per Year) 3.3-17
3.5-1 Previously Recorded Cultural Resources within 1 mile of the Project Area 3.5-11
3.6-1 Historic Earthquakes Magnitude 5.0 or Greater in Kern County Area 3.6-6
3.6-2 Modified Mercalli Intensity Scale 3.6-7
3.7-1 Recommended Actions from ARB Climate Change Scoping Plan 3.7-11
3.7-2 Estimated Emissions of Greenhouse Gases from Operation of the Project 3.7-16
3.9-1 Summary of Maximum Model-Predicted Groundwater Level Change 3.9-24
3.9-2 Water Quality for Select Parameters 3.9-31
3.12-1 Typical Construction Noise Levels 3.12-6
3.12-2 Typical Noise Levels from Construction Equipment 3.12-7
3.12-3 Vibration Velocities for Construction Equipment 3.12-9
3.13-1 Level of Service Definitions 3.13-4
3.14-1 Estimated Maximum Operational Energy Consumption 3.14-9
4-1 Capital Improvement and Development Projects 4-5
4-2 Groundwater Banking Programs in Kern County 4-6
5-1 IRWD Population Projections 5-2
5-2 Rosedale Population Projections 5-3
5-3 IRWD'S Single Dry-Year Supply and Demand (AFY) 5-3
5-4 MWD'S Single Dry-Year Supply Capability and Total Demand (AFY) 5-4
5-5 IRWD Current and Planned Water Supplies (AFY) 5-5
5-6 Amount of Groundwater Projected to Be Pumped (AFY) 5-5
5-7 Historic Consumptive Use within Rosedale District (AFY) 5-6
6-1 Summary of Project Impact Analysis 6-3
6-2 Summary of Alternatives Analysis Relative Impacts as Compared to the Proposed Project 6-9

Acronyms Used in this Report

AADT	annual average daily traffic
AB	Assembly Bill
ACI	American Concrete Institute
AF	acre feet
AFY	acre feet per year
AIA	Air Impact Assessment
AISC	American Institute of Steel Construction
ALUCP	Airport Land Use Compatibility Plan
AMSL	above mean sea level
APCD	Air Pollution Control Districts
AQMD	Air Quality Management Districts
AQMP	Air Quality Management Plan
ARB	Air Resources Board
As	Arsenic
ASCE	American Society of Civil Engineers
ASR	Aquifer Storage and Recovery
ATSFRR	Atchison, Topeka & Santa Fe Railroad
AVEK	Antelope Valley East Kern Water Agency
BACM	best available control measures
bgs	below ground surface
BMP	best management practice
BO	Biological Opinion
BVWSD	Buena Vista Water Storage District
California Register	California Register of Historical Resources
Caltrans	California Department of Transportation
CalEEMod	California Emissions Estimator Model
CBC	California Building Code
CCAA	California Clean Air Act
CCR	California Code of Regulations
CDC	California Department of Conservation
CDFW	California Department of Fish and Wildlife
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
CHL	California Historical Landmarks
CMP	Congestion Management Plan
CNDDB	California Natural Diversity Data Base
CNEL	Community Noise Equivalent Level
CO	carbon monoxide
COG	Council of Governments

CPUC	California Public Utilities Commission
CTR	California Toxics Rule
CUP	conditional use permit
CVC	Cross Valley Canal
CVP	Central Valley Project
CVWD	Carpenteria Valley Water District
CWA	Clean Water Act
CWSC	California Water Service Company
dB	decibel
dBA	A-weighted decibels
DNL	Day-Night Noise Level
DOGGR	Division of Oil, Gas and Geothermal Resources
DPM	Diesel particulate matter
DPR	Department of Parks and Recreation
DTSC	Department of Toxic Substance Control
DWR	Department of Water Resources
EDB	ethylene dibromide
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
ERP	Emergency Response Plan
°F	Fahrenheit
FCAA	Federal Clean Air Act
FCAAA	Federal Clean Air Act Amendments
FEMA	Federal Emergency Management Agency
FESA	federal Endangered Species Act
FIP	Federal Implementation Plan
FIRM	Flood Insurance Rate Map
FMMP	Farmland Mapping and Monitoring Program
FR	Federal Register
FRA	Federal Railway Administration
FTA	Federal Transit Administration
FTIP	Federal Transportation Improvement Program
GET	Golden Empire Transit
HAP	Hazardous Air Pollutants
HCP	Habitat Conservation Plan
HRI	California State Historic Resources Inventory
HSWA	Hazardous and Solid Waste Act
IBC	International Building Code
ID	Irrigation District
IRWD	Irvine Ranch Water District
ISR	Indirect Source Review
KBWA	Kern Water Bank Authority
KCC	Kern County Code

KCL	Kern County Land Company
KCWA	Kern County Water Agency
KRT	Kern Regional Transit
L_{eq}	average energy over time
LACM	Los Angeles County Natural History Museum
LOS	Level of Service
M&I	municipal and industrial
MACT	Maximum Achievable Control Technology
MBHCP	Metropolitan Bakersfield Habitat Conservation Plan
MBTA	Migratory Bird Treaty Act
MCL	maximum contaminant level
MEI	Maximally Exposed Individual
mg/l	milligrams per liter
Metropolitan	Metropolitan Water District of Southern California
MMI	Modified Mercalli Intensity
MMRP	Mitigation Monitoring and Reporting Plan
MOU	Memorandum of Understanding
mph	miles per hour
MRZ	Mineral Resource Zones
MW	megawatts
MWD	Metropolitan Water District of Southern California
MWDOC	Municipal Water District of Orange County
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
National Register	National Register of Historic Places
NCP	National Contingency Plan
NESHAP	National Emission Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NO_3	nitrate
NOx	nitrogen oxides
NOC	Notice of Completion
NOD	Notice of Determination
NOP	Notice of Preparation
NORSD	North of River Sanitary District
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRCS	Natural Resources Conservation Service
OEHHA	Office of Environmental Health Hazard Assessment
OHP	California Office of Historic Preservation
OSHA	Occupational Safety and Health Administration
PAH	polycyclic aromatic hydrocarbons
Pb	lead

PCBs	polychlorinated biphenyls
pCi/L	picocuries per liter
PCE	Perchloroethene
PG&E	Pacific Gas & Electric
PHI	Points of Historical Interest
PM2.5	particulate matter less than 2.5 microns in diameter
PM10	particulate matter less than 10 microns in diameter
PPV	peak particle velocity
PRC	Public Resources Code
PUR	Pesticides Use Reporting
RCPG	Regional Comprehensive Plan and Guide
RCRA	Resource Conservation and Recovery Act
RMS	root mean square
ROG	reactive organic gases
Rosedale	Rosedale-Rio Bravo Water Storage District
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
SARA	Superfund Amendments and Reauthorization Act
SCAG	Southern California Association of Governments
SDC	Seismic Design Category
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SSJVIC	Southern San Joaquin Valley Information Center
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_4	sulfates
SOI	sphere of influence
SPRR	Southern Pacific Railroad
SR	State Route
SRAs	State Responsibility Areas
SVP	Society for Vertebrate Paleontology
SWP	State Water Project
SWPPP	Storm Water Pollution Prevention Plans
SWRCB	State Water Resources Control Board
TAC	Toxic Air Contaminants
TCE	trichloroethene
TDS	total dissolved solids
TMDL	Total Maximum Daily Load
TSCA	Toxic Substances Control Act
UWMP	Urban Water Management Plan
U.S.	United States

USACE	U.S. Army Corps of Engineers
Vdb	vibration velocity
VMT	vehicle miles traveled
WEAP	Worker's Environmental Awareness Program
WSD	Water Storage District
WW II	World War II

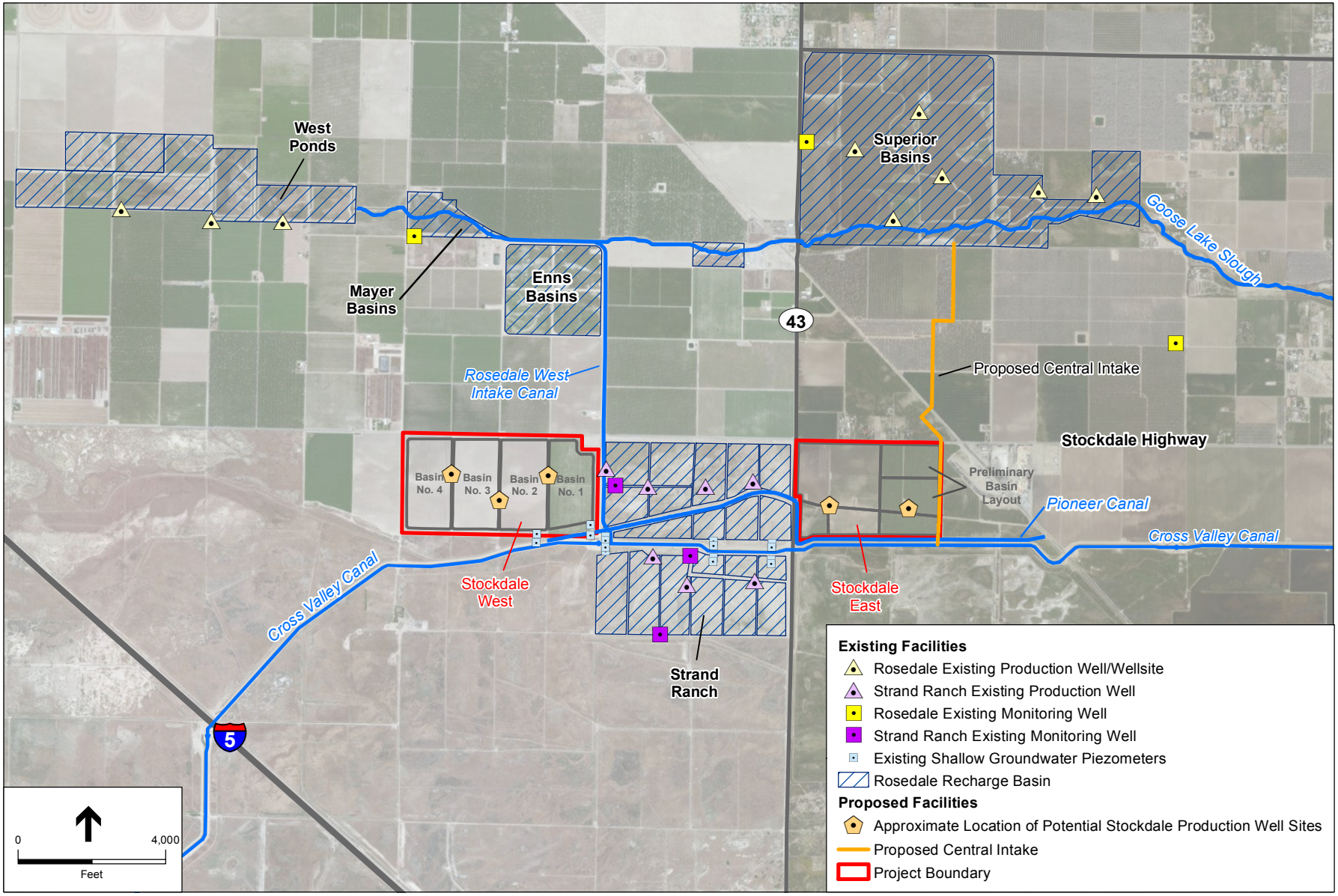
SUMMARY

S.1 Introduction

The Rosedale-Rio Bravo Water Storage District (Rosedale) as the Lead Agency, in consultation with the Irvine Ranch Water District (IRWD) as a Responsible Agency, has prepared this Draft Environmental Impact Report (Draft EIR) to provide information about the potential effects on the local and regional environment associated with the Stockdale Integrated Banking Project (proposed project). The proposed project would allow both agencies to utilize available storage in the local San Joaquin Valley Groundwater Basin by developing groundwater banking facilities on up to three project sites located approximately six miles west of the City of Bakersfield. As shown in **Figure S-1**, the proposed project would include the Stockdale East property, which is owned by Rosedale, the Stockdale West property, which is owned by IRWD, and a potential third project site that would be located within a designated radius around both properties (collectively referred to as the "Stockdale Properties"). The proposed project would also include a new Central Intake Pipeline conveyance system and new turnouts along the Cross Valley Canal. Operation of the proposed project would be coordinated with Rosedale's existing Groundwater Storage, Banking, Exchange, Extraction & Conjunctive Use Program (Conjunctive Use Program) and the existing Rosedale-IRWD Strand Ranch Integrated Banking Project (Strand Ranch Project). The proposed project would provide greater operational flexibility for Rosedale and would enhance water supply reliability for IRWD by providing contingency storage to augment supplies during periods when other supply sources may be limited or not available.

This Draft EIR has been prepared in compliance with the California Environmental Quality Act (CEQA) of 1970 (as amended), codified at California Public Resources Code Sections 21000 et. seq., and the State *CEQA Guidelines* in the Code of Regulations, Title 14, Division 6, Chapter 3. Inquiries about the proposed project should be directed to:

Rosedale-Rio Bravo Water Storage District
Attn: Eric Averett, General Manager
849 Allen Road
P.O. Box 20820
Bakersfield, CA 93390-0820
(661) 589-6045



SOURCE: ESRI, 2014.

Stockdale Integrated Banking Project . 211181

Figure S-1

Proposed Project Facilities

S.2 Project Background

Rosedale-Rio Bravo Water Storage District

Rosedale was established in 1959 to develop a groundwater recharge program to offset overdraft conditions in the regional Kern County aquifer. Rosedale, located west of Bakersfield, encompasses 44,150 acres in Kern County, with 27,500 acres developed as irrigated agriculture and about 7,500 acres developed for urban uses. Rosedale's service area overlies the Kern County Subbasin of the San Joaquin Valley Groundwater Basin.

Rosedale's Conjunctive Use Program

Rosedale's Conjunctive Use Program currently manages approximately 470,000 acre feet (AF) of stored groundwater in the underlying basin, which has an estimated total storage capacity in excess of 1.7 million acre-feet (AF) (Sierra Scientific Services, 2009). The Conjunctive Use Program encompasses a broad range of activities intended to benefit Rosedale and its landowners through better management of the groundwater resource, integrating and incorporating all of Rosedale's available facilities to this end.

Rosedale has groundwater banking agreements with several participants as part of the Conjunctive Use Program, such that all recharge must occur in advance of extraction. Water supplies for the Conjunctive Use Program are supplied by the participating water agencies and include, but are not limited to, high-flow Kern River water and supplies from the Central Valley Project (CVP) and State Water Project (SWP). Currently, the infrastructure for the Conjunctive Use Program includes over 1,000 acres of recharge basins and several recovery wells. The current Program provides for maximum annual recharge of approximately 252,000 acre-feet per year (AFY) and maximum annual recovery of approximately 62,500 AFY. Rosedale certified a Final Master EIR covering the Conjunctive Use Program in July 2001. In addition, Rosedale has certified subsequent CEQA documents for individual project components.

Irvine Ranch Water District

IRWD was established in 1961 as a California Water District pursuant to the California Water District Law (California Water Code, Division 13). IRWD provides potable and recycled water, sewage collection and treatment, and urban runoff treatment to municipal and industrial (M&I), and agricultural customers within an 115,531-acre service area in Orange County, California. Along with the implementation of numerous water use efficiency programs, IRWD continues to develop a diverse mix of supplies including the use of high quality groundwater, impaired groundwater, and recycled water. Currently, 78 percent of the water IRWD provides for its customers comes from local sources, including groundwater (produced from the Orange County Groundwater Basin managed by Orange County Water District), recycled water, and surface water. The remaining 22 percent of IRWD's water supply is imported by the Metropolitan Water District of Southern California (Metropolitan or MWD) and purchased by IRWD through the Municipal Water District of Orange County (MWDOC).

IRWD is further improving its water supply reliability by developing water banking facilities in Kern County. Groundwater banking allows for storage of surplus water during wet hydrologic periods for use during periods when other supply sources may be reduced or interrupted. To enhance IRWD's ability to respond to drought conditions or potential supply interruptions, IRWD is developing long-term contingency storage for the purpose of recharging and banking supplemental water which can be called upon for delivery when needed. To-date, IRWD has implemented the Strand Ranch Project and the Stockdale West Pilot Recharge Project, as described below.

Strand Ranch Integrated Banking Project

IRWD currently participates in Rosedale's Conjunctive Use Program through its Strand Ranch Project. Strand Ranch is located in western Kern County and borders Rosedale's service area (see Figures 1-1 and 1-2). The Strand Ranch Project includes approximately 502 acres of groundwater recharge basins; seven production wells that have been completed onsite; and joint-use wells offsite that are currently being constructed by Rosedale. In the Strand Ranch Project, IRWD has the ability to store up to 50,000 AF and recover up to 17,500 AFY in accordance with its banking project terms with Rosedale. IRWD has priority rights to use the recharge basins when Rosedale is not recharging Kern River floodwaters and has first priority rights to the use of the recovery facilities. Rosedale has second priority use of Strand Ranch facilities. The water that Rosedale stores on its own behalf does not count against the 50,000 AF of storage dedicated to IRWD. Rosedale manages operation of the Strand Ranch Project on behalf of IRWD.

Stockdale West Pilot Recharge Project

In 2011, IRWD implemented a one-year Pilot Recharge Project on Stockdale West, which is directly adjacent to Strand Ranch. The purpose of the Pilot Recharge Project was to determine the recharge capabilities of Stockdale West, which would assist in determining the feasibility and physical limits of a long-term water banking project at the property. The one-year Pilot Project was limited to recharge of 10,000 AF of water over a one year period of time, which augmented the 17,500 AF of recharge allowed on Strand Ranch by IRWD. Water recharged during the Pilot Project was stored in IRWD's 50,000 AF storage account at the Strand Ranch. Water recharged during the Pilot Project will be recovered from Strand Ranch. As a result of the Pilot Project, IRWD is planning to implement groundwater banking at Stockdale West as part of the proposed Stockdale Integrated Banking Project.

In addition, in response to the declared State of Emergency in California due to prolonged drought conditions (January 17, 2014; April 25, 2014), IRWD implemented the Stockdale West Ranch Emergency Project in February 2015 (Notice of Exemption, February 17, 2015), which will allow for recharge of up to 10,000AF at Stockdale West using the existing recharge basins. Similar to the Pilot Project, the Emergency Project will be limited to recharge of 10,000 AF of water over a one year period of time, which will augment the 17,500 AF of recharge allowed on Strand Ranch by IRWD. Water recharged during the Emergency Project will be stored in IRWD's 50,000 AF storage account at the Strand Ranch. Water recharged during the Emergency Project will be recovered from Strand Ranch within the 17,500 AF per year recovery limits.

S.3 Project Objectives

The objectives of the proposed project are as follows:

- Integrate the proposed project facilities and coordinate the proposed project operations with Rosedale's Conjunctive Use Program, including the Strand Ranch Project, to provide for maximum operational flexibility between the various programs and facilities.
- Provide additional groundwater recharge, storage, and recovery capacity in the Kern River Fan region to augment and provide operating flexibility for Rosedale's existing and future programs.
- Develop recharge and recovery capacities for each of IRWD's and Rosedale's respective properties to be available for its priority use and for the other agency's use to the extent unused capacity may be available.
- Develop additional groundwater recharge, storage, and recovery capacity to provide IRWD customers with increased water supply reliability through redundancy and diversification during periods when other supply sources may be reduced or interrupted.

S.4 Project Description

The proposed project consists of three sites: Stockdale East, Stockdale West, the Central Intake Pipeline alignment, and a third project site that may be made up of non-contiguous parcels and that has yet to be specifically located. There is approximately 26,000 AF of available storage under Stockdale West and approximately 18,400 AF of available storage under Stockdale East (Thomas Harder & Co., 2013). This is additive to Rosedale's existing 1.7 million AF of storage that underlies its services area, given that Stockdale East and Stockdale West are outside of Rosedale's boundary. However, Rosedale would manage the Stockdale Properties and their associated storage along with the Conjunctive Use Program. Once the third Stockdale project site has been identified, the associated storage underlying the site would be determined. Based on characteristics of Stockdale East and West, a third proximate site of up to 640 acres may have storage of approximately 51,200 AF. In addition to storage under Stockdale West, IRWD will have access to an additional 50,000 AF of storage in Rosedale's Conjunctive Use Program ("Acquired Storage Account"). Water put into storage under the Acquired Storage Account would be recharged either through the proposed project or Strand Ranch Project or coordinated use of other Rosedale facilities.

Recharge capacities for the Stockdale Properties are estimated to be approximately 27,100 acre-feet per year (AFY) for Stockdale West and approximately 19,000 AFY for Stockdale East (Thomas Harder & Co., 2015). Recharge capacity is based on an estimated infiltration rate of 0.28 feet per day for 365 days (Thomas Harder & Co., 2015). Recovery facilities would be designed to extract approximately 11,250 AFY at Stockdale West and approximately 7,500 AFY at Stockdale East. Once the third Stockdale project site has been identified, the associated recharge and recovery capacities would be determined. Based on characteristics of Stockdale East and Stockdale West, a third proximate site of up to 640 acres may have recharge capacities of approximately 52,200 AFY and recovery of approximately 22,500 AFY. All groundwater

banking facilities on Stockdale West would be owned by IRWD and operated and maintained by Rosedale for the duration of the proposed project. All groundwater banking facilities on Stockdale East would be owned, operated, and maintained by Rosedale.

The proposed Central Intake Pipeline would connect the Goose Lake Slough to the CVC and will serve as a conveyance for delivery of recharge water to Stockdale East and the existing Superior Basins, and for delivery of water pumped from Stockdale East wells and other Rosedale wells on the Superior Basins to regional conveyance facilities via the CVC. The Central Intake Pipeline would generally run along and between existing agricultural parcels, along the eastern edge of the Stockdale East property, and up to a new pump station and CVC turnout/turn-in facility. The Central Intake Pipeline will be owned and operated by Rosedale.

S.5 Project Alternatives

An EIR must describe a range of reasonable alternatives to the proposed project or alternative project locations that could feasibly attain most of the basic project objectives and would avoid or substantially lessen any of the significant environmental impacts of the proposed project. The alternatives analysis must include the "No Project Alternative" as a point of comparison. The No Project Alternative includes existing conditions and reasonably foreseeable future conditions that would exist if the proposed project were not approved (*CEQA Guidelines* §15126.6). The following alternatives are discussed further in **Chapter 6, Alternatives Analysis**.

No Project Alternative

Under the No Project Alternative, IRWD would not construct recovery wells on Stockdale West, and Rosedale would not construct recharge basins and recovery wells on Stockdale East, or the Central Intake Pipeline. Stockdale East would continue to be operated for agricultural production and Stockdale West also would accommodate agricultural activities within the existing recharge basins, including grazing. Groundwater would continue to be pumped from agricultural wells to support agricultural activities at both properties, with no recharge to offset such pumping. The third Stockdale project site would not be identified and developed, and the Stockdale Properties would not be integrated with Rosedale's Conjunctive Use Program. Under the No Project Alternative, IRWD's water supply would be less reliable during periods when existing supplies may be reduced or interrupted. Rosedale would continue to explore and develop partnerships with other water districts within or outside of the Kern Fan to expand its Conjunctive Use Program.

Alternatives Rejected from Further Consideration

Additional alternatives considered and rejected from further consideration by Rosedale and IRWD include alternative locations to Stockdale East and Stockdale West for constructing groundwater banking facilities; alternative alignment locations for the Central Intake Pipeline; construction of injection wells on the Stockdale Properties to inject water into the groundwater basin rather than construct recharge basins on the surface; development of local IRWD storage facilities in Orange County; enhanced conservation policies to be implemented during periods of

drought; and increased use of recycled water to reduce potable water demands. These alternatives did not meet the project objectives, were found to result in significant environmental impacts, or were otherwise determined to be infeasible.

Summary of Alternatives Analysis

One of the primary purposes of the alternatives analysis is to identify project alternatives that may avoid or substantially lessen significant project impacts (*CEQA Guidelines* §15126.6). The proposed project would not result in any significant impacts as documented in the analyses provided in Chapters 3, 4, and 5 of this Draft EIR. Nonetheless, CEQA requires that an EIR shall assess the No Project Alternative. A comparison of the proposed project to the No Project Alternative presents a tradeoff between achieving project objectives and impacting the environment. The No Project Alternative would avoid all the environmental impacts of the proposed project but would not meet any of the project objectives. The No Project Alternative also would forego any environmental benefits to the San Joaquin Valley Groundwater Basin such as correction of overdraft conditions, including those due to groundwater pumping to support irrigated agriculture at the Stockdale East property.

CEQA requires that an EIR identify the environmentally superior alternative of a project other than the No Project Alternative (*CEQA Guidelines* §15126.6(e)(2)). Since the proposed project would be compatible with agricultural land uses, support sustainable use of groundwater for agriculture in Kern County, benefit the San Joaquin Valley Groundwater Basin through recharge and storage, enhance water supply reliability for IRWD, and not result in any significant impacts that cannot be mitigated, the proposed project is considered the environmentally superior alternative.

S.6 Areas of Controversy

During the public comment period and during scoping session held for the proposed project, concerns were raised regarding potential adverse impacts to the following: water quality; special status species; water supply sources for the proposed project; and adverse impacts to the City of Bakersfield's water supply and surrounding environment. These concerns have been addressed in Chapters 3 and 4 of this Draft EIR.

S.7 Summary of Impacts

Table S-1, at the end of this chapter, presents a summary of the impacts and mitigation measures identified for the proposed project. The complete impact statements and mitigation measures are presented in Chapters 3 and 4 of this Draft EIR. The level of significance for each impact was determined using significance criteria (thresholds) developed for each category of impacts; these criteria are presented in the appropriate sections of Chapter 3. Significant impacts are those adverse environmental impacts that meet or exceed the significance thresholds; less than significant impacts would not exceed the thresholds. **Table S-1** indicates the measures that will be implemented to avoid, minimize, or otherwise reduce significant impacts to a less than significant level.

The impacts associated with the proposed project would occur during both construction and operational phases. Most construction impacts would be short term and temporary. These construction related impacts either are considered less than significant or are reduced to less than significant levels with appropriate mitigation measures. Operation of the proposed project would primarily affect hydrology and groundwater, in particular changes in groundwater levels during recharge and recovery operations. Operational impacts either are considered less than significant or are reduced to less than significant levels with appropriate mitigation measures. The proposed project would not result in any significant and unavoidable impacts.

S.8 Organization of this EIR

The chapters of this Draft EIR are as follows:

S. Summary. This chapter summarizes the contents of the Draft EIR.

1. Introduction and Project Background. This chapter discusses the CEQA process and the purpose of the EIR, and background information for the proposed project.

2. Project Description. This chapter provides an overview of the proposed project, describes the need for and objectives of the proposed project, and provides detail on the characteristics of the proposed project.

3. Environmental Setting, Impacts and Mitigation Measures. This chapter describes the environmental setting and identifies impacts of the proposed project for each of the following environmental resource areas: 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; Mineral Resources; Noise; Transportation and Traffic; and Utilities and Energy. Measures to mitigate the impacts of the proposed project are presented for each resource area where significant potential impacts have been identified. References are included in each chapter.

4. Cumulative Impacts Analysis. This chapter describes the potential impacts of the proposed project when considered together with other related projects in the project area.

5. Growth Inducement Potential. This chapter summarizes population projections and water demands within the IRWD and Rosedale service areas and describes the potential for the proposed project to induce development.

6. Alternatives Analysis. This chapter presents an overview of the alternatives development process and describes the alternatives to the proposed project that were considered.

7. Report Preparers. This chapter identifies those involved in preparing this Draft EIR, including persons and organizations consulted.

TABLE S-1
SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Potential Impact	Mitigation Measure	Significance Determination
Aesthetics		
Impact AES-1: The proposed project could alter the existing visual character of the sites by changing the land use from agricultural production to a combination of groundwater recharge, water conveyance, and agricultural production.	None required.	Less than Significant.
Impact AES-4: The proposed project would create new sources of nighttime lighting.	**Mitigation Measure AES-1:** All nighttime construction lighting and security lighting installed on new facilities shall be shielded and directed downward to avoid light spill onto neighboring properties.	Less than Significant with Mitigation.
Agriculture and Forestry Resources		
Impact AGR-1: The proposed project would build groundwater banking and conveyance facilities on lands designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance.	None required.	Less than Significant.
Impact AGR-2: The proposed project could build groundwater banking facilities on lands under a Williamson Act contract.	**Mitigation Measure AGR-1:** If the third Stockdale project site is under a Williamson Act contract, then the use of the property would be managed as applicable in accordance with Kern County's *Agricultural Preserve Standard Uniform Rules*, which identify land uses that are compatible within agricultural preserves established under the Williamson Act.	Less than Significant with Mitigation.
Impact AGR-3: The proposed project could convert farmland to a combined land use of groundwater recharge and agricultural production.	Implement **Mitigation Measure BIO-5**.	Less than Significant with Mitigation.
Air Quality		
Impact AQ-1: The proposed project could conflict with or obstruct implementation of SJVAPCD air quality plan.	None required.	Less than Significant.
Impact AQ-2: Construction and/or operation of the project could generate emissions of criteria air pollutants that could contribute to existing nonattainment conditions.	None required.	Less than Significant.
Impact AQ-3: Construction and operation of the project could result in cumulatively considerable increases of criteria pollutant emissions.	None required.	Less than Significant.

TABLE S-1
SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Potential Impact	Mitigation Measure	Significance Determination
Impact AQ-4: Construction and/or operation of the project could expose sensitive receptors to substantial pollutant concentrations.	None required.	Less than Significant.
Impact AQ-5: Operation of the project could create objectionable odors affecting a substantial number of people.	None required.	Less than Significant.
Biological Resources		
Impact BIO-1: Construction of the proposed project could result in adverse impact to special-status species.	**Mitigation Measure BIO-1:** The following measures would reduce potential impacts to nesting and migratory birds and raptors to less than significant levels: • Within 15 days of site clearing, a qualified biologist shall conduct a preconstruction, migratory bird and raptor nesting survey. The biologist must be qualified to determine the status and stage of nesting by migratory birds and all locally breeding raptor species without causing intrusive disturbance. This survey shall include species protected under the Migratory Bird Treaty Act including the tricolored blackbird. The survey shall cover all reasonably potential nesting locations for the relevant species on or closely adjacent to the proposed project site. • Nesting habitat should be removed prior to the bird breeding season (February 1 – September 30). • If an active nest is confirmed by the biologist, no construction activities shall occur within 250 feet of the nesting site for migratory birds and within 500 feet of the nesting site for raptors. The buffer zones around any nest within which project-related construction activities would be avoided can be reduced as determined acceptable by a qualified biologist. Construction activities may resume once the breeding season ends (February 1 – September 30), or the nest has either failed or the birds have fledged. **Mitigation Measure BIO-2:** If construction activities are scheduled to take place outside of the Swainson's hawk nesting season (which runs from March 1 – September 15), then no preconstruction clearance surveys or subsequent avoidance buffers are required. If construction activities are initiated within the nesting season then preconstruction nesting surveys shall be conducted by a qualified biologist prior to ground disturbance, in accordance with the guidance provided in the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Technical Advisory Committee, 2000). The required windshield surveys shall cover a one-half mile radius around the project sites. If a nest site is found, the qualified biologist shall determine the appropriate buffer zone around the nest within which project-related construction activities would be avoided. In addition, the qualified biologist shall consult with Rosedale and/or IRWD to determine whether consultation with CDFW is necessary. **Mitigation Measure BIO-3:** A pre-construction survey shall be conducted for burrowing owls 14 to 30 days prior to clearing of the site by a qualified biologist in accordance with the most recent CDFW protocol, currently the *Staff Report on Burrowing Owl Mitigation* (CDFW 2012). Surveys shall cover suitable burrowing owl habitat disturbed by construction including a 500-foot buffer. The survey would	Less than Significant with Mitigation.

TABLE S-1
SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Potential Impact	Mitigation Measure	Significance Determination
	identify adult and juvenile burrowing owls and signs of burrowing owl occupation. This survey shall include two early morning surveys and two evening surveys to ensure that all owl pairs have been located. If occupied burrowing owl habitat is detected on the proposed project site, measures to avoid, minimize, or mitigate impacts shall be incorporated into the proposed project and shall include, but not be limited to, the following: • If owls are identified on or adjacent to the site, a qualified biologist shall provide a pre-construction Worker's Environmental Awareness Program to contractors and their employees that describes the life history and species protection measures that are in effect to avoid impacts to burrowing owls. Construction monitoring will also occur throughout the duration of ground-disturbing construction activities to ensure no impacts occur to burrowing owl. • Construction exclusion areas shall be established around the occupied burrows in which no disturbance shall be allowed to occur while the burrows are occupied. Buffer areas shall be determined by a qualified biologist based on the recommendations outlined in the most recent Staff Report on Burrowing Owl Mitigation (CDFW 2012). • If occupied burrows cannot be avoided, a qualified biologist shall develop and implement a Burrowing Owl Management Plan. The biologist shall develop the Plan in consultation with Rosedale and/or IRWD and shall coordinate with CDFW as necessary. **Mitigation Measure BIO-4:** IRWD and Rosedale shall conduct a USFWS-approved "early evaluation" of the project area to determine if the project sites represent San Joaquin kit fox habitat. If the evaluation shows that the San Joaquin kit fox does not utilize the project sites, and the project will not result in take, then no further mitigation shall be required for this endangered species. If the "early evaluation" finds potential for the presence of kit fox, USFWS may require a San Joaquin kit fox survey to be conducted by a qualified biologist, in accordance with the most recent USFWS *San Joaquin Kit Fox Survey Protocol*. If it is determined that the San Joaquin kit fox has the potential to utilize the property then the following measures are required to avoid potential adverse effects to this species: • Rosedale and/or IRWD shall initiate discussions with the USFWS to determine appropriate project modifications to protect kit fox, including avoidance, minimization, restoration, preservation, or compensation. • If evidence of active or potentially active San Joaquin kit fox dens is found within the area to be impacted by the proposed project, compensation for the habitat loss shall be determined and provided in consultation with USFWS and CDFW. **Mitigation Measure BIO-5:** Prior to ground disturbing activities at the Goose Lake Slough and third Stockdale site, a qualified biologist shall conduct a pre-construction floristic survey and, if deemed necessary, focused rare plant survey of project areas to determine and map the location and extent of special-status plant species populations and natural communities of special concern within disturbance areas. Focused rare plant surveys shall occur during the typical blooming periods of special-status plants with the potential to occur. The plant surveys shall follow the CDFW Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (November 24, 2009). If a special-status plant species is found to be present, and avoidance of the species and/or habitat is not feasible, the implementing agency shall retain a qualified botanist to prepare and implement a	

TABLE S-1
SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Potential Impact	Mitigation Measure	Significance Determination
	Revegetation/Restoration Mitigation Plan. **Mitigation Measure BIO-6:** Prior to ground disturbing activities at the third Stockdale site, a habitat assessment shall be conducted by a qualified biologist to determine the potential for special-status wildlife species to occur within affected areas. If the habitat assessment determines that a special-status species has the potential to be present within a minimum of 500 feet of the construction zone, a qualified biologist shall determine whether subsequent focused surveys are required prior to project implementation to determine presence or absence. If a special-status wildlife species is found to be present, and avoidance of the species and/or habitat is not feasible, then Mitigation Measures BIO-1 through BIO-4 shall be implemented as appropriate, or Rosedale and/or IRWD shall consult with a qualified biologist to prepare a species-specific mitigation plan and determine whether consultation with wildlife agencies are recommended.	
Impact BIO-2: The proposed project could have a substantial adverse effect on sensitive natural communities.	Implement **Mitigation Measure BIO-5**.	Less than Significant with Mitigation.
Impact BIO-3: The proposed project could have a substantial adverse effect on federally protected wetlands.	**Mitigation Measure BIO-7:** For project components that have potential to impact jurisdictional features, prior to ground disturbing activities, a qualified biologist shall be retained to conduct a jurisdictional delineation in areas that may be affected by the project. If jurisdictional resources are identified, the qualified biologist shall prepare a jurisdictional delineation report outlining the potential acreage of jurisdictional features that may be impacted. The jurisdictional delineation report will be submitted to USACE for a jurisdictional determination. If the delineation report determines that jurisdictional waters and/or wetlands are present within the project site, regulatory permits may be required prior to project impacts which include mitigation and/or compensation to reduce impacts to jurisdictional features to a less than significant level. Based on the results of the delineation report, permits required may include a 404 or Nationwide Permit from USACE, a 401 Certification from RWQCB and/or a Streambed Alteration Agreement from CDFW. Project impacts under 0.10 acres may not require a permit from USACE but only a notification of impact. The appropriate permits required to reduce impacts to jurisdictional features will be determined through initial consultation with the resource agencies.	Less than Significant with Mitigation.
Impact BIO-4: The proposed project could conflict with the Metropolitan Bakersfield Habitat Conservation Plan.	None required.	Less than Significant.
Cultural Resources		
Impact CUL-1: The project could cause a substantial adverse change in the significance of a historical or archaeological resource, as defined in CEQA Guidelines Section 15064.5.	**Mitigation Measure CUL-1:** In the event that prehistoric or historic subsurface cultural resources are discovered during ground-disturbing activities, all work within 50 feet of the resources will be halted and Rosedale or IRWD (as applicable) will consult with a qualified archaeologist to assess the significance of the find according to *CEQA Guidelines* Section 15064.5. If any find is determined to be significant, then Rosedale or IRWD and the archaeologist will meet to determine the appropriate avoidance measures or other appropriate mitigation. Rosedale or IRWD (as applicable) will make the final determination. All significant cultural materials recovered will be, as necessary and at the discretion of	Less than Significant with Mitigation.

TABLE S-1
SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Potential Impact	Mitigation Measure	Significance Determination
	the consulting archaeologist, subject to scientific analysis, professional museum curation, and documentation according to current professional standards. In considering any suggested mitigation proposed by the consulting archaeologist in order to mitigate impacts to historical resources or unique archaeological resources, Rosedale or IRWD will determine whether avoidance is necessary and feasible in light of factors such as the nature of the find, project design, costs, and other considerations. If avoidance is infeasible, other appropriate measures (e.g., data recovery) will be instituted. Work may proceed on other parts of the project site while mitigation for historical resources or unique archaeological resources is being carried out. **Mitigation Measure CUL-2:** For any project components not previously subject to archaeological survey (e.g., the third Stockdale site), prior to the initiation of ground disturbance, a qualified archaeologist shall be retained to carry out a Phase I Cultural Resources Survey of the project component. The Phase I Survey shall identify and evaluate the significance of any resources that may be directly or indirectly impacted by the proposed project. The Phase I Survey effort shall be documented in a Phase I Report. If as a result of the additional Phase I Survey any resource is found to be a historical or unique archaeological resource as defined in PRC Section 21084.1 and 21083.2(g), respectively, then **Mitigation Measure CUL-1** shall be implemented.	
Impact CUL-2: The project could directly or indirectly affect a unique paleontological resource or site or unique geologic feature, as defined in CEQA Guidelines Section 15064.	**Mitigation Measure CUL-3:** In the event that paleontological resources are discovered, Rosedale or IRWD (depending upon the project component) will notify a qualified paleontologist. The paleontologist will document the discovery as needed, evaluate the potential resource, and assess the significance of the find under the criteria set forth in *CEQA Guidelines* Section 15064.5. If fossil or fossil bearing deposits are discovered during construction, excavations within 50 feet of the find will be temporarily halted or diverted until the discovery is examined by a qualified paleontologist. The paleontologist will notify the appropriate agencies to determine procedures that would be followed before construction is allowed to resume at the location of the find. If Rosedale or IRWD determines that avoidance is not feasible, the paleontologist will prepare an excavation plan for mitigating the effect of the project on the qualities that make the resource important. The plan will be submitted to Rosedale or IRWD for review and approval prior to implementation. **Mitigation Measure CUL-4:** Once the location of the third Stockdale site is determined (or any additional project components), prior to the initiation of ground disturbance, a paleontological literature, map, and museum locality review shall be conducted in order to assess the paleontological sensitivity of the project component. If the literature, map, and museum locality review identifies potentially sensitive paleontological resources, then a qualified paleontologist shall be retained to conduct a pedestrian survey and assessment of the project component. A report shall be prepared which summarizes the results of the survey and assessment and provides recommendations regarding implementation of mitigation, such as **Mitigation Measure CUL-3**.	Less than Significant with Mitigation.

TABLE S-1
SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Potential Impact	Mitigation Measure	Significance Determination
Impact CUL-3: The proposed project could result in adverse impacts to human remains.	**Mitigation Measure CUL-5:** If human remains are uncovered during project construction, Rosedale or IRWD (as applicable) shall immediately halt work, contact the Kern County Coroner to evaluate the remains, and follow the procedures and protocols set forth in Section 15064.4 (e)(1) of the *California Environmental Quality Act Guidelines*. If the Coroner determines the remains are Native American in origin, the Coroner shall contact the Native American Heritage Commission (NAHC). As provided in Public Resources Code Section 5097.98, the NAHC shall identify the person or persons believed to be most likely descended from the deceased Native American. The most likely descendent shall be afforded the opportunity to provide recommendations concerning the future disposition of the remains and any associated grave goods as provided in PRC 5097.98.	Less than Significant with Mitigation.
Geology, Soils, and Seismicity		
Impact GEO-1: The proposed project could expose new structures to adverse effects related to strong seismic ground shaking, ground failure, and liquefaction.	Implement **Mitigation Measure HYDRO-2.**	Less than Significant with Mitigation.
Impact GEO-2: The proposed project could result in soil erosion or the loss of topsoil.	Implement **Mitigation Measure HYDRO-1.**	Less than Significant with Mitigation.
Impact GEO-3: Operation of the proposed project could affect groundwater levels and result in on-site or off-site subsidence from compaction.	None required.	Less than Significant.
Greenhouse Gas Emissions		
Impact GHG-1: The proposed project could generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.	None required.	Less than Significant.
Impact GHG-2: The proposed project could conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.	None required.	Less than Significant.
Hazards and Hazardous Materials		
Impact HAZ-1: The proposed project could create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	None required.	Less than Significant.

TABLE S-1
SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Potential Impact	Mitigation Measure	Significance Determination
Impact HAZ-2: The proposed project could 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.	**Mitigation Measure HAZ-1:** Prior to construction at Stockdale East, Rosedale shall collect representative samples of soils remaining in place near the oilfield as identified in the Phase 1 Environmental Site Assessment. The samples shall be analyzed for total petroleum hydrocarbons and pesticides. Rosedale shall avoid if feasible or otherwise remove from the site soils identified as containing hazardous quantities of contaminants and dispose of such soils in accordance with applicable hazardous waste regulations. **Mitigation Measure HAZ-2:** In the event that asbestos-containing materials are uncovered during project construction, work at the project sites shall immediately halt and a qualified hazardous materials professional shall be contacted and brought to the project sites to make a proper assessment of the suspect materials. All potentially friable asbestos-containing materials shall be removed in accordance with Federal, State, and local laws and the National Emissions Standards for Hazardous Air Pollutants guidelines prior to ground disturbance that may disturb such materials. All demolition activities shall be undertaken in accordance with California Occupational Safety and Health Administration standards, as contained in Title 8 of the CCR, Section 1529, to protect workers from exposure to asbestos. Materials containing more than one percent asbestos shall also be subject to San Joaquin Valley Air Pollution Control District regulations. Demolition shall be performed in conformance with Federal, state, and local laws and regulations so that construction workers and/or the public avoid significant exposure to asbestos-containing materials. **Mitigation Measure HAZ-3:** A Phase I Environmental Site Assessment shall be prepared for the Central Intake Pipeline and the third Stockdale project site to identify potential hazards and hazardous materials located within a one-mile radius. The construction contractor shall be informed of potential hazards and shall develop appropriate plans to avoid or remediate hazards.	Less than Significant with Mitigation.
Impact HAZ-3: The proposed project could emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.	**Mitigation Measure HAZ-4:** In the event the third Stockdale project site is located within a quarter mile of any school facilities, prior to construction, the contractors shall coordinate the proposed project construction route with the impacted school district and school facility to avoid school safety routes.	Less than Significant with Mitigation.
Impact HAZ-4: The proposed project could be located on a site which is included on a list of hazardous materials sites and could create a significant hazard to the public or the environment.	Implement **Mitigation Measure HAZ-3**.	Less than Significant with Mitigation.
Impact HAZ-5: The proposed project operation could cause an increase in airborne insect populations.	**Mitigation Measure HAZ-5:** IRWD and Rosedale shall coordinate with the Kern County Department of Public Health Services and the Kern Mosquito and Vector Control District prior to project operations to develop and implement, if necessary, appropriate insect abatement methods. Such methods shall not utilize any substances that may contaminate groundwater.	Less than Significant with Mitigation.

TABLE S-1
SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Potential Impact	Mitigation Measure	Significance Determination
Hydrology and Water Quality		
Impact HYDRO-1: The proposed project could violate water quality standards or waste discharge requirements during construction or project operation.	**Mitigation Measure HYDRO-1:** The SWPPP for the proposed project shall include the following BMPs: • Establish an erosion control perimeter around active construction and contractor layout areas including silt fencing, jute netting, straw waddles, or other appropriate measures to control sediment from leaving the construction area. • Stockpiled soils shall be watered, covered, or otherwise managed to prevent loss due to water and wind erosion. • Install containment measures at fueling stations and at fuel and chemical storage sites. Employ good house-keeping measures including clearing construction debris and waste materials at the end of each day.	Less than Significant with Mitigation
Impact HYDRO-2: The proposed project could deplete groundwater supplies and lower the groundwater table through extraction of banked groundwater.	None required.	Less than Significant.
Impact HYDRO-3: Recharge operations on the proposed project site could result in groundwater mounding that could potentially impact underground structures or impair recharge efforts of adjacent groundwater banking operations.	**Mitigation Measure HYDRO-2:** Prior to operation of the project, Rosedale shall develop and implement a shallow groundwater monitoring plan for purposes of protecting subsurface structures of the Cross Valley Canal (CVC). Piezometers shall be installed adjacent to the CVC at Stockdale East and the third Stockdale project site if applicable. Piezometers have already been installed at Stockdale West. The location and design of the new piezometers shall be approved by the Kern County Water Agency (KCWA). Piezometers at the Stockdale Properties shall be used to monitor groundwater levels beneath the CVC. Prior to initiating the project, a California state licensed geotechnical engineer shall conduct an analysis to determine the critical depth at which shallow groundwater would pose a threat to the stability of CVC structures. Based on this analysis, the monitoring plan shall identify depths at which monitoring frequency shall change, such as from monthly to weekly to daily, as shallow groundwater levels approach the critical depth. The monitoring plan shall also identify the depth at which project operation would cease such that the critical depth would not be reached and the conditions under which project operation could resume. The monitoring plan shall be approved by KCWA.	Less than Significant with Mitigation.
Impact HYDRO-4: The proposed project could substantially alter the existing drainage pattern of a site that could result in substantial erosion or siltation on- or off-site.	Implement **Mitigation Measure HYDRO-1.**	Less than Significant with Mitigation.
Impact HYDRO-5: The proposed project could substantially degrade groundwater quality by the addition of recharge water.	Implement **Mitigation Measure HAZ-1**	Less than Significant with Mitigation

TABLE S-1
SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Potential Impact	Mitigation Measure	Significance Determination
Impact HYDRO-6: The proposed project could place structures within a 100-year flood hazard area.	**Mitigation Measure HYDRO-3:** If the third Stockdale project site includes a flood hazard area, then associated project facilities would be designed either: (1) to avoid development within the flood hazard area, or (2) to ensure that flood hazards or flood elevations on neighboring parcels are not significantly altered.	Less than Significant with Mitigation.
Lane Use and Planning		
Impact LU-1: The proposed project could conflict with any applicable land use plan, policy, or regulation of the jurisdiction over the project.	**Mitigation Measure LU-1:** A General Plan Amendment may be requested from Kern County to eliminate the mid-section line setback requirements from the Stockdale properties.	Less than Significant (LU-1 is not required)
Impact LU-3: The proposed project could conflict with the Metropolitan Bakersfield Habitat Conservation Plan.	None required.	Less than Significant.
Mineral Resources		
Impact MRS-1: The proposed project could block access to oil resources beneath the Stockdale Properties.	None required.	Less than Significant.
Noise		
Impact NOISE-1: The proposed project could generate noise levels that exceed noise standards.	None required.	Less than Significant.
Impact NOISE-2: The proposed project could generate or result in excessive groundborne vibration or groundborne noise levels.	None required.	Less than Significant.
Impact NOISE-3: The proposed project could result in a substantial permanent increase in ambient noise levels in the project vicinity.	None required.	Less than Significant.
Impact NOISE-4: The proposed project could result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity.	**Mitigation Measure NOISE-1:** To reduce temporary construction related noise impacts at the third Stockdale site, the following shall be implemented by the construction contractor: a. Place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site. b. Locate equipment staging in areas that will create the greatest possible distance between construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction. c. Ensure proper maintenance and working order of equipment and vehicles, and that all	Less than Significant with Mitigation.

TABLE S-1
SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Potential Impact	Mitigation Measure	Significance Determination
	construction equipment is equipped with manufacturers approved mufflers and baffles. d. Install sound-control devices in all construction and impact equipment, no less effective than those provided on the original equipment.	
Transportation and Traffic		
Impact TR-1: The proposed project could conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system.	**Mitigation Measure TR-1:** For project features that require open-trench construction across roadways, the Construction Traffic Control Plan for the proposed project shall include measures that ensure Rosedale provides signage and flagging to alert motorists of pending and actual lane or road closures and detours. Such measures shall conform to the requirements of the Kern County Roads Department and any requirements of related encroachment permits.	Less than Significant with Mitigation.
Impact TR-2: The proposed project could conflict with an applicable congestion management program and reduce the level of service of surrounding roads and highways.	None required.	Less than Significant.
Impact TR-3: The proposed project could result in a substantial increase to hazards due to a design feature or incompatible uses.	**Mitigation Measure TR-2:** IRWD and Rosedale shall require the construction contractor to prepare and implement a Construction Traffic Control Plan that conforms to requirements of the Kern County Roads Department, California Department of Transportation District 6, and the California Department of Transportation Manual on Uniform Traffic Control Devices and Work Area Traffic Control Handbook. The construction contractor shall obtain all necessary permits for the work within the road right-of-way or use of oversized/overweight vehicles that will utilize county maintained roads, which may require California Highway Patrol or a pilot car escort. Implement **Mitigation Measure HAZ-4**	Less than Significant with Mitigation.
Impact TR-4: The proposed project could result in inadequate emergency access.	Implement **Mitigation Measure TR-2.**	Less than Significant with Mitigation.
Utilities and Energy		
Impact UTIL-1: The proposed project could require new or expanded water supply resources or entitlements.	None required.	Less than Significant.
Impact UTIL-2: The proposed project could require additional landfill capacity.	None required.	Less than Significant.
Impact UTIL-3: The proposed project could result in a substantial increase in energy consumption that could affect local and regional energy supplies.	**Mitigation Measure UTIL-1:** IRWD and Rosedale shall install energy efficient equipment, including pumps and motors, for operation of the proposed project.	Less than Significant with Mitigation.

TABLE S-1
SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Potential Impact	Mitigation Measure	Significance Determination
Cumulative Impacts		
Impact CUM-1: Concurrent construction of several projects in the vicinity of the Stockdale Properties could result in cumulative short-term impacts associated with air quality, biological resources, cultural resources, noise, traffic, and water quality.	**Mitigation Measure CUM-1:** The construction contractor shall consult with appropriate local agencies and jurisdictions prior to initiating ground-disturbing activities, to determine if other construction projects will occur coincidentally at the same time and in the vicinity of the proposed project, depending on project schedule. Coordination of construction activities for coincident projects shall occur to ensure impacts to noise and traffic do not compound to be cumulatively significant and to ensure compatibility of activities within construction zones. Adjustments to construction schedules and plans shall be made accordingly as necessary.	Less than Significant with Mitigation.
Impact CUM-2: The proposed project and related projects could result in cumulative long-term impacts to groundwater resources.	**Mitigation Measure CUM-2**: Operation of the proposed project shall be conducted in accordance with the Long Term Project Recovery Operations Plan Regarding Rosedale-Rio Bravo Water Storage District Projects (Long Term Operations Plan). The Long Term Operations Plan requires monitoring of groundwater conditions; annual predictions of project-related groundwater declines in the area; definition of negative project impact (NPI) to neighboring wells relative to no-project conditions; triggers for implementation of mitigation measures based on NPI that affects neighboring well operation; and mitigation measures to be implemented for different categories of wells. Mitigation measures include, but are not limited to, providing compensation to lower well pumps; reducing or adjusting pumping to prevent, avoid, or eliminate the NPI; or drilling a new well.	Less than Significant with Mitigation.
Impact CUM-3: The proposed project and related projects could result in cumulative long-term impacts to agricultural resources.	None required.	Less than Significant.

CHAPTER 1
Introduction and Project Background

Introduction

The Rosedale-Rio Bravo Water Storage District (Rosedale) and the Irvine Ranch Water District (IRWD) are proposing to implement the Stockdale Integrated Banking Project (proposed project) in western Kern County. The proposed project would allow both agencies to utilize available storage in the local San Joaquin Valley Groundwater Basin by developing groundwater banking facilities on up to three project sites located approximately six miles west of the City of Bakersfield. As shown in **Figure 1-1**, the proposed project would include the Stockdale East property, which is owned by Rosedale, the Stockdale West property, which is owned by IRWD, and a potential third project site that would be located within a designated radius around both properties (collectively referred to as the "Stockdale Properties"). The proposed project would also include a new Central Intake Pipeline conveyance system and new turnouts along the Cross Valley Canal. Operation of the proposed project would be coordinated with Rosedale's existing Groundwater Storage, Banking, Exchange, Extraction & Conjunctive Use Program (Conjunctive Use Program) and the existing Rosedale-IRWD Strand Ranch Integrated Banking Project (Strand Ranch Project). The proposed project would provide greater operational flexibility for Rosedale and would enhance water supply reliability for IRWD by providing contingency storage to augment supplies during periods when other supply sources may be limited or not available.

1.1 Purpose of the EIR

Rosedale as the Lead Agency, in consultation with IRWD as a Responsible Agency, has prepared this Draft Environmental Impact Report (EIR) to provide the public, trustee agencies, and other responsible agencies with information about the potential effects on the local and regional environment associated with construction and operation of the proposed project. This Draft EIR has been prepared in compliance with the California Environmental Quality Act (CEQA) of 1970 (as amended), codified at California Public Resources Code Sections 21000 et. seq., and the State *CEQA Guidelines* in the Code of Regulations, Title 14, Division 6, Chapter 3.

This Draft EIR describes the environmental impacts of the proposed project and suggests mitigation measures where necessary to reduce impacts to a less than significant level. The impact analyses are based on a variety of sources, including publicly-available documents, agency consultation, technical studies and field surveys.

Rosedale and IRWD intend to use this EIR to consider implementation of the proposed project. According to CEQA, when a project is to be carried out by multiple public agencies, one agency

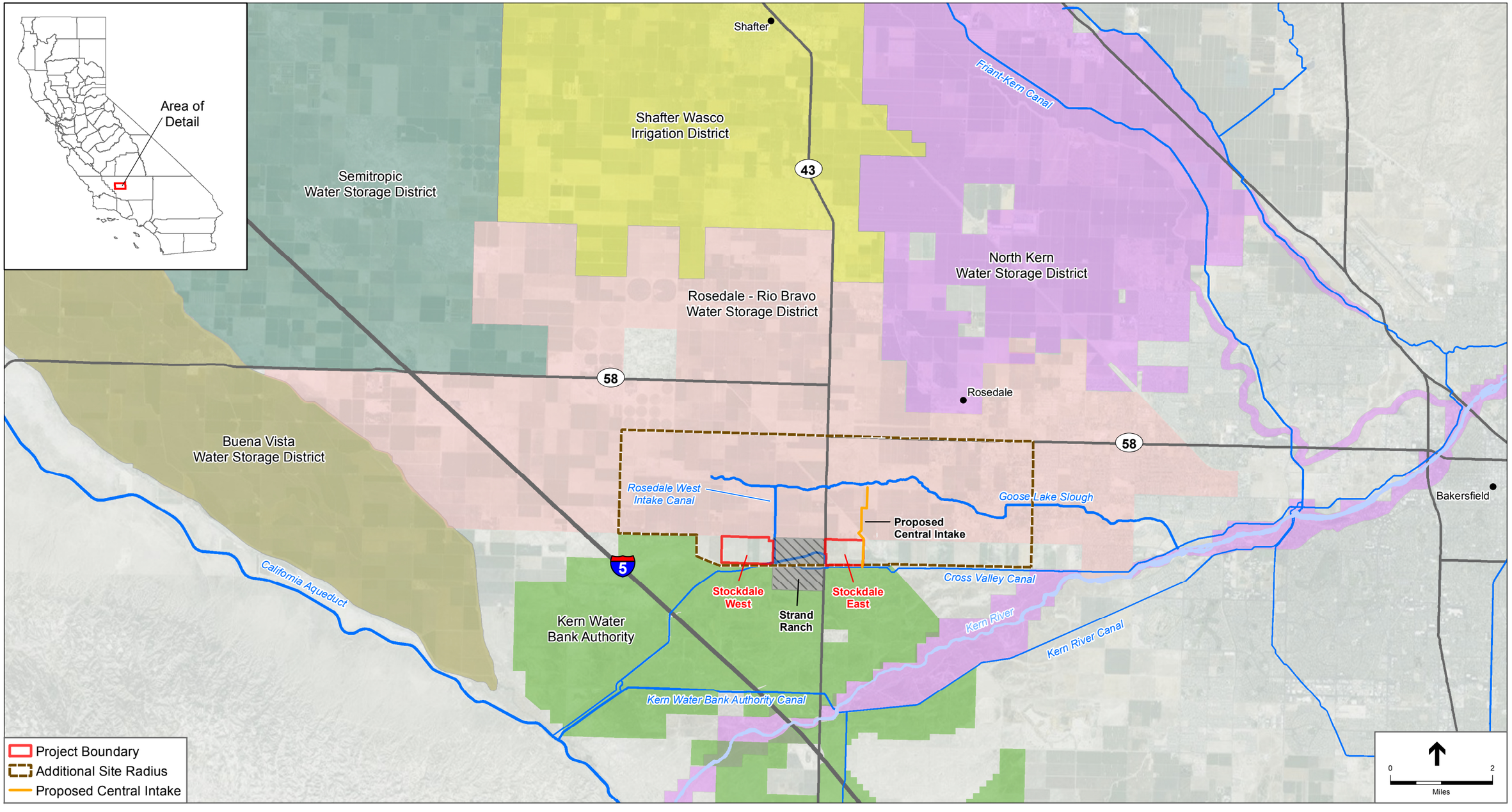
is selected to be the lead agency and the other agencies are designated as responsible agencies (*CEQA Guidelines* §15050(a)). The proposed project is a joint project of both Rosedale and IRWD. For purposes of this EIR, Rosedale is the Lead Agency and IRWD is the Responsible Agency. The Rosedale Board of Directors, as the decision-making body for the Lead Agency, independently shall consider and certify this EIR prior to approving the proposed project. The Lead Agency shall certify that this EIR has been completed in compliance with CEQA and that the EIR reflects its independent judgment and analysis (*CEQA Guidelines* §15090(a)). The IRWD Board of Directors, as the decision-making body for the Responsible Agency, shall consider the Lead Agency's EIR prior to approving the project, and shall certify that it reviewed and considered the information contained in this EIR (*CEQA Guidelines* §15050(b)).

1.2 Project-level and Program-level Analyses in this Draft EIR

The *CEQA Guidelines* Section 15161 defines a project-level EIR as "focusing primarily on the changes in the environment that would result from project development." Project-level analyses examine all phases of a proposed project, including planning, construction, and operation, at a site-specific level. This Draft EIR evaluates construction and operation of facilities at Stockdale East, Stockdale West, the Central Intake Pipeline, and associated turnouts and pump station at a site-specific project level, consistent with *CEQA Guidelines* Section 15161 and 15378(a).

Under CEQA, a project is defined as "the whole of an action" that could result in direct or indirect environmental effects (*CEQA Guidelines* Section 15378). For the proposed project, the whole of the action includes the third Stockdale project site. The Stockdale East, Stockdale West, and the third Stockdale site, together with associated conveyances such as the Central Intake Pipeline system, are considered together to comprise the Stockdale Integrated Banking Project. Because the location of the third Stockdale site has not been identified, a program-level analysis of impacts is provided in this Draft EIR in accordance with *CEQA Guidelines* Section 15168. A program-level analysis allows a public agency to evaluate the effects of a series of actions that are related geographically and as logical parts in a chain of contemplated actions. The advantages of a program-level analysis include providing more comprehensive consideration of alternatives and cumulative impacts than would be possible for individual actions, and avoiding duplicative reconsideration of basic policy considerations, while also reducing paperwork.

If and when the third Stockdale project site is identified, subsequent project-level environmental review will be conducted pursuant to *CEQA Guidelines* Section 15168(c). This Draft EIR would provide the basis for any future project-level CEQA analysis for the third Stockdale site (CEQA Guidelines Section 15168(d)).



SOURCE: ESRI 2013

Stockdale Integrated Banking Project . 211181

Figure 1-1

Regional Location

This page intentionally left blank

1.3 Organization of this EIR

The chapters of this Draft EIR are as follows:

ES. Executive Summary. This chapter summarizes the contents of the Final EIR.

1. **Introduction and Project Background.** This chapter discusses the purpose of the EIR, the CEQA process, and pertinent background information about both Rosedale and IRWD, and the proposed project.
2. **Project Description.** This chapter provides an overview of the proposed project, describes the need for and objectives of the proposed project, and provides detail on the characteristics of the proposed project.
3. **Environmental Setting, Impacts and Mitigation Measures.** This chapter describes the baseline environmental setting and identifies impacts of the proposed project for each of the following environmental resource areas: 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; Mineral Resources; Noise; Transportation and Traffic; and Utilities and Energy. Measures to mitigate the impacts of the proposed project are presented for each resource area where significant potential impacts have been identified.
4. **Cumulative Impacts Analysis.** This chapter describes the potential impacts of the proposed project when considered together with combined impacts of other related projects in the project area.
5. **Growth Inducement Potential.** This chapter summarizes population projections and water demands within the IRWD and Rosedale service areas and describes the potential for the proposed project to induce growth.
6. **Alternatives Analysis.** This chapter presents an overview of the alternatives development process and describes the alternatives to the proposed project that were considered.
7. **Report Preparers.** This chapter identifies those involved in preparing this EIR, including persons and organizations consulted.

1.4 CEQA Process

1.4.1 Public Scoping

Notice of Preparation

In accordance with Section 15082 of the *CEQA Guidelines*, a Notice of Preparation (NOP) of an EIR was prepared and circulated for review by applicable local, state and federal agencies and the public (See **Appendix A**). On September 24, 2013, the NOP was mailed to interested parties, responsible and trustee agencies, and the Office of Planning and Research. The NOP was published in the Bakersfield Californian and Orange County Register, and a Notice of Completion (NOC) was sent to the State Clearinghouse. The NOP was made available for public

review at the Beale Memorial Library in Kern County and the Heritage Park Regional Library in Orange County, and on IRWD's internet site: www.irwd.com.

The NOP provided a general description of the facilities associated with the proposed project, a summary of the probable environmental effects of the project to be addressed in the EIR, and a figure showing the project location. The NOP provided the public and interested public agencies with the opportunity to review the proposed project and to provide comments or concerns on the scope and content of the environmental review document including: the range of actions; alternatives; mitigation measures, and significant effects to be analyzed in depth in the EIR.

The 30-day project scoping period, which began with the distribution of the NOP, remained open through October 24, 2013. During the scoping period, four comment letters were received from the California Department of Fish and Wildlife, Arvin-Edison Water Storage District, City of Bakersfield, and San Joaquin Valley Air Pollution Control District. These letters are provided in the Scoping Summary in Appendix A.

Public Scoping Meeting

CEQA recommends conducting early coordination with the general public, appropriate public agencies, and local jurisdictions to assist in developing the scope of the environmental document. Pursuant to *CEQA Guidelines* Section 15083, two public scoping meetings were held on October 15, 2013 at IRWD's district office and on October 16, 2013 at Rosedale's district office, to allow agency consultation and public involvement for the Draft EIR. A public notice was placed in the local newspapers of general circulation in the Rosedale and IRWD service areas, the Bakersfield Californian and Orange County Register, to inform the general public of the scoping meeting and the availability of the NOP. The purpose of the meeting was to present to the public the proposed project and its potential environmental impacts. Attendees were provided an opportunity to voice comments or concerns regarding potential effects of the proposed project. Comments received during the scoping meetings are included in the Scoping Summary in Appendix A.

1.4.2 Draft EIR

This Draft EIR contains a description of the proposed project, description of the baseline environmental setting for each resource listed in the Appendices F and G of the *CEQA Guidelines*, identification of project impacts (direct, indirect, and cumulative), mitigation measures for impacts found to be significant, and an analysis of project alternatives.

The *CEQA Guidelines* Section 15125(a) requires that a Draft EIR include a description of the physical environmental conditions as they exist when the NOP is published. This environmental setting typically constitutes the baseline against which the lead agency compares the physical environmental changes that may occur as a result of the project and determines whether such impacts are significant. The baseline environmental conditions for the analysis included within this Draft EIR are generally from September 2013, when the NOP was published. However, for dynamic resources that can fluctuate greatly, such as river flow or groundwater levels, the baseline can also constitute a range of conditions over a representative time period. This ensures that an outlier or transitory condition is not used as the baseline condition out of context and that

a representative range is established from which to analyze impacts of the project. For the analysis in this Draft EIR, the baseline for groundwater levels is based on historical hydrological conditions and is described further in **Chapter 3.9, Hydrology and Water Quality**.

As described above, this Draft EIR provides an assessment of impacts at the project level for facilities and activities associated with Stockdale East, Stockdale West, the Central Intake Pipeline, and associated turnouts and pump station (*CEQA Guidelines* §15161) and at the program level for facilities and activities associated with the third Stockdale project site (*CEQA Guidelines* §15168). A subsequent assessment of impacts will be required prior to implementation of project facilities at the third Stockdale project site, once the location has been identified.

Significance criteria have been developed for each environmental resource analyzed in this Draft EIR, based on Appendices F and G of the *CEQA Guidelines*. Impacts are categorized as follows:

- **Significant and Unavoidable:** mitigation might be recommended but impacts are still significant.
- **Less than Significant with Mitigation:** potentially significant impact but mitigated to a less than significant level;
- **Less than Significant:** mitigation is not required under CEQA but may be recommended; or
- **No Impact:** impacts would not occur or project has features that prevent impacts**.**

CEQA requires that a lead agency avoid or substantially lessen significant impacts where feasible (*CEQA Guidelines* §15091 and §15092). No significant and unavoidable impacts have been identified in this Draft EIR. All potentially significant impacts would be substantially lessened though means such as implementation of mitigation measures or project design features.

1.4.3 Public Review

This document is being circulated to local, state and federal agencies, and to interested organizations and individuals who may wish to review and comment on the Draft EIR. Publication of this Draft EIR marks the beginning of a 45-day public review period, during which written comments may be submitted at any time. Written comments on the Draft EIR must be received at the following address prior to the end of the 45-day review period.

Eric Averett
General Manager
Rosedale-Rio Bravo Water Storage District
P.O. Box 20820
Bakersfield, CA 93390-0820
eaverett@rrbwsd.com

During the 45-day review period, two public informational meetings will be held to present the results of the Draft EIR and allow for the submittal of verbal or written comments. The meetings will be held as follows:

	Rosedale-Rio Bravo Water Storage District	Irvine Ranch Water District
DATE:	May 12, 2015	May 13, 2015
TIME:	11:00 AM	6:00 PM
LOCATION:	849 Allen Road Bakersfield, California	15600 Sand Canyon Avenue Irvine, California

1.4.4 Final Environmental Impact Report Publication

Written and oral comments received in response to the Draft EIR will be addressed in a Response to Comments document which, together with the Draft EIR, will constitute the Final EIR. As the decision-making body of the lead agency, the Rosedale Board of Directors will then consider the Final EIR for certification (*CEQA Guidelines* §15090). The Rosedale Board of Directors will certify that it has reviewed and considered the information contained in the Final EIR, that the Final EIR reflects the lead agency's independent judgment and analysis, and that the Final EIR has been completed in compliance with CEQA. Once the Final EIR has been certified, the lead agency may proceed to consider project approval. Prior to approving the project, the lead agency must make written Findings with respect to each significant environmental effect identified in the Draft EIR in accordance with Section 15091 of the *CEQA Guidelines*.

CEQA requires that the lead agency neither approve nor implement a project unless the project's significant environmental effects have been reduced to a less than significant level, essentially "eliminating, avoiding, or substantially lessening" the expected impacts. If the lead agency approves the project despite residual significant impacts that cannot be mitigated to a less than significant level, the agency must state the reasons for its action in writing in a Statement of Overriding Considerations (SOC). As defined in *CEQA Guidelines* Section 15093, a SOC balances the benefits of a project against its unavoidable environmental consequences. The SOC must be included in the record of the project approval.

As a Responsible Agency, IRWD will also adopt the Final EIR, adopt Findings, and if necessary adopt a Statement of Overriding Considerations, prior to approving the project and proceeding with project implementation, in accordance with *CEQA Guidelines* Section 15096.

Within five working days after the Rosedale Board of Directors has approved the project, the lead agency will file a Notice of Determination (NOD) with the Kern County Clerk and the State Clearinghouse (*CEQA Guidelines* §15094). As a responsible agency, IRWD also will file an NOD with the Kern County and Orange County Clerks and State Clearinghouse.

1.4.5 Mitigation Monitoring and Reporting Program

State law requires lead agencies to adopt a mitigation monitoring and reporting program (MMRP) for those changes to the project that have been adopted or made a condition of project approval in order to mitigate or avoid significant effects on the environment. The *CEQA Guidelines* do not require that the specific reporting or monitoring program be included in the EIR. Throughout this Draft EIR, however, proposed mitigation measures, as well as monitoring and reporting requirements, have been clearly identified and presented in language that will facilitate

establishment of a monitoring program. All adopted measures will be included in a MMRP to verify compliance. The MMRP may be included as an attachment to the Final EIR.

1.5 Project Background and Context

1.5.1 Rosedale-Rio Bravo Water Storage District

The water districts of Kern County are leaders in the development of groundwater banking programs in California. Portions of Kern County are characterized by hydrogeologic conditions that are particularly suitable for groundwater recharge operations. Kern County is also strategically located in central California near federal, state, and local water supply conveyance facilities. The groundwater banking programs of Kern County benefit local customers and water districts and also provide groundwater storage for districts in northern and southern California.

Rosedale is located west of Bakersfield and encompasses approximately 44,150 acres in Kern County (Figure 1-1), with 27,500 acres developed as irrigated agriculture and approximately 7,500 acres developed for urban uses. Rosedale's service area overlies the Kern County Subbasin of the San Joaquin Valley Groundwater Basin. Rosedale was established in 1959 to develop a groundwater recharge program to offset overdraft conditions in the underlying basin. Prior to the groundwater recharge efforts initiated by Rosedale, groundwater levels in the District were declining at a rate of eight to ten feet per year. Through implementation of groundwater recharge programs and participation in the State Water Project (SWP), Rosedale slowed the decline in groundwater levels dramatically. In the mid-1990s, groundwater levels again were declining, and Rosedale initiated the Conjunctive Use Program.

Defining Conjunctive Use

"Conjunctive use" refers to coordinating the management of surface water and groundwater to improve the overall reliability of water supply (Pacific Institute, 2011). "Groundwater banking" is the practice of recharging specific amounts of water in a groundwater basin that can later be withdrawn and used by the entity that deposited the water (Pacific Institute, 2011). Groundwater banking uses underground aquifers for percolation and storage purposes, as an alternative to building aboveground storage, and offers water users both within and outside of the groundwater basin the opportunity to store water there. It allows flexibility to respond to seasonal and inter-annual variability, as water can be stored in wet periods, when water is abundant, for use in dry periods, when water may be in short supply. Groundwater banking programs may benefit water levels in the local aquifer because the amount of water available for recovery is less than the amount recharged; this difference can mitigate for overdraft conditions and raise groundwater levels.

Rosedale's Conjunctive Use Program

Rosedale's Conjunctive Use Program currently manages approximately 470,000 acre feet (AF) of stored groundwater in the underlying basin, which has an estimated total storage capacity in excess of 1.7 million acre-feet (AF) (Sierra Scientific Services, 2009). The Conjunctive Use Program encompasses a broad range of activities intended to benefit Rosedale and its landowners through better management of the groundwater resource, integrating and incorporating all of

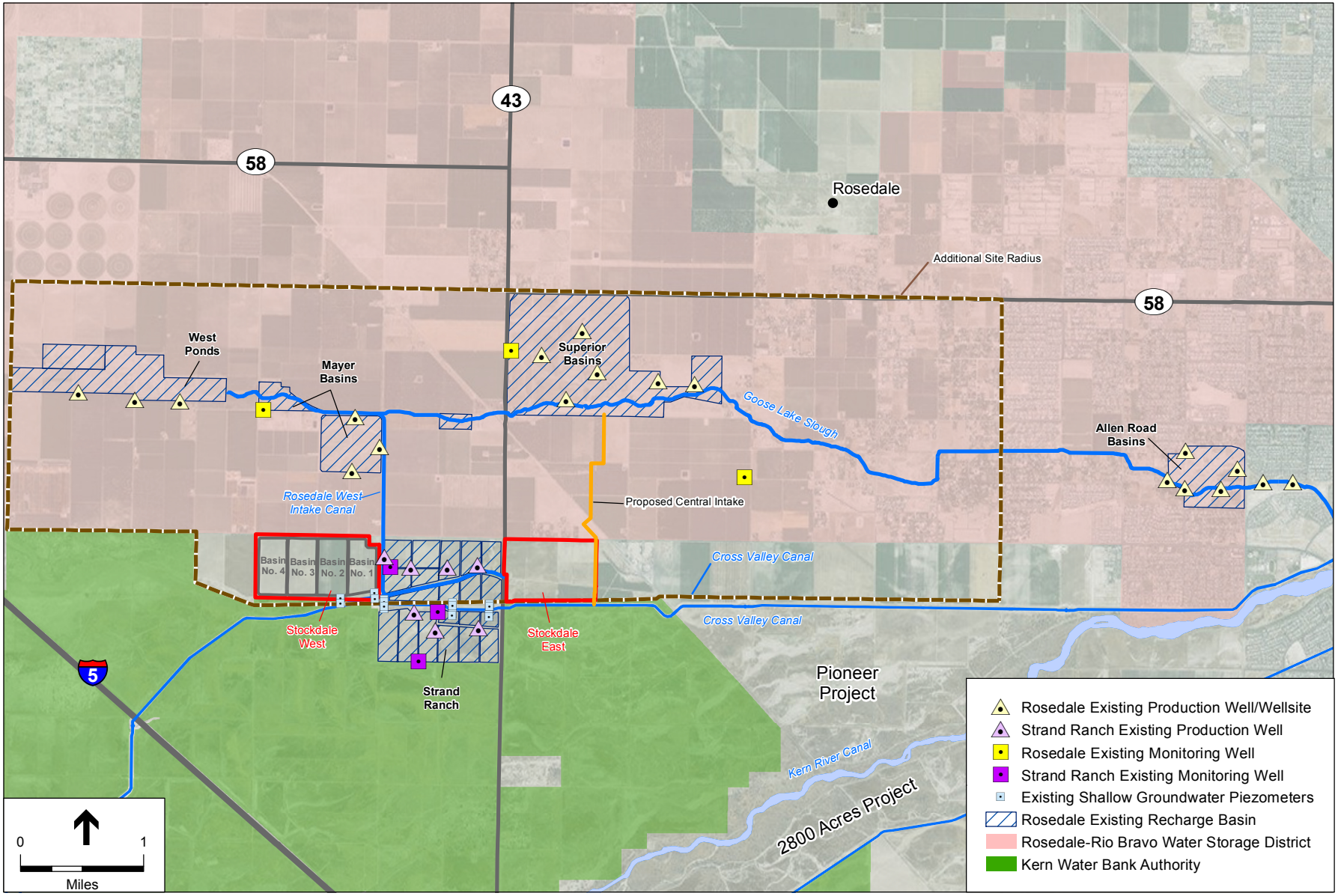
Rosedale's available facilities to this end.

Rosedale has groundwater banking agreements with several participants as part of the Conjunctive Use Program, under which all recharge must occur in advance of extraction. Water supplies for the Conjunctive Use Program are supplied by the participating water agencies and include, but are not limited to, high-flow Kern River water and supplies from the Central Valley Project (CVP) and State Water Project (SWP). Currently, the infrastructure for the Conjunctive Use Program includes over 1,000 acres of recharge basins and several recovery wells (**Figure 1-2**). The current Conjunctive Use Program provides for maximum annual recharge of approximately 252,000 acre-feet per year (AFY) and maximum annual recovery of approximately 62,500 AFY.

Master EIR for the Conjunctive Use Program

In 2001, Rosedale certified a Master Environmental Impact Report (Master EIR) that outlined parameters of the Conjunctive Use Program. The Master EIR is designed to expand and integrate additional groundwater banking opportunities in association with out-of-district partners. Any new facilities incorporated into the Conjunctive Use Program after 2001 require site-specific analysis prior to implementation. Since 2001, Rosedale has adopted CEQA compliance documentation for five specific projects that fall within the Conjunctive Use Program. The Strand Ranch Project represented an addition to the Conjunctive Use Program, and as such, the Strand Ranch Final EIR did not tier from the Master EIR. Similarly, this EIR for the Stockdale Integrated Banking Project is not tiered from the Master EIR, and represents an addition to the Conjunctive Use Program. The recharge and recovery amounts identified in this document are in addition to the amounts identified in the Master EIR, additional CEQA documentation, and subsequent addenda.

In 2011, Rosedale completed an assessment of the integrated operation of all its Conjunctive Use Program groundwater banking and sales programs and facilities, including specific projects such as the Strand Ranch Project (ESA, 2011). The assessment concluded that the premise of integration is explicit within the Master EIR and operating the Conjunctive Use Program expressly as an integrated program would not result in any environmental effect not already foreseen and considered in the CEQA compliance documentation to-date.



SOURCE: ESRI ,2015

Stockdale Integrated Banking Project . 211181

Figure 1-2

Existing Water Banking Facilities

1.5.2 Rosedale's Operating Plans

Memoranda of Understanding

Effective January 1, 2003, Rosedale entered into two (2) MOUs with adjoining entities in the Kern Fan area, which include Semitropic Water Storage District, Buena Vista Water Storage District, Henry Miller Water Storage District, Berrenda Mesa Water Storage District, Kern Water Bank Authority, Improvement District No 4, and West Kern Water District. The MOUs provide guidelines for operation and monitoring of Rosedale's groundwater banking programs. The proposed project would be subject to and consistent with the conditions of these MOUs, as provided in **Appendix B**.

The MOUs allow for Rosedale to operate its Conjunctive Use Program to achieve maximum water storage and withdrawal benefits, while also avoiding, eliminating, or mitigating adverse impacts to the groundwater basin and to the operation of other groundwater banking programs in the Kern Fan area. As part of the operating objectives defined in the MOUs, Rosedale's Conjunctive Use Program includes the following:

- Maintain, or if possible enhance, the quality of the groundwater in its district. For example, Rosedale will attempt to implement recovery operations in such a manner that TDS in recovery waters exceed TDS of recharge waters.
- Control the migration of poor quality water. For example, Rosedale could increase water recharge in areas with favorable groundwater gradients.
- Operate recharge and recovery facilities in such a manner to "prevent, eliminate, or mitigate significant adverse impacts." Mitigation measures to avoid adverse impacts could include but not be limited to the following:
  - if necessary provide buffer areas between recovery wells and neighboring districts;
  - limit monthly or annual recovery rates;
  - provide redundancy in recovery wells and rotate pumping from recovery wells;
  - provide adequate well spacing;
  - adjust or stop pumping if necessary to reduce impacts; and
  - use recharge water that otherwise is not recharging the Kern Fan area.

The MOUs also establish a Monitoring Committee, which includes Rosedale and all Adjoining Entities. The Monitoring Committee is collectively responsible for monitoring groundwater levels and water quality in the Kern Fan area. The MOUs stipulate that modifications to Rosedale's Conjunctive Use Program would be subject to environmental review pursuant to CEQA and would require review by the Monitoring Committee. Operation of the proposed project would be coordinated with Rosedale's Conjunctive Use Program, and this EIR will satisfy the CEQA requirements as indicated in the MOUs.

Long Term Operations Plan

Rosedale has also developed the *Long Term Project Recovery Operations Plan Regarding Rosedale-Rio Bravo Water Storage District Projects* (Long Term Operations Plan), which implements the provisions of the MOU and is provided in Appendix B. This Long Term Operations Plan is based on the current Interim Operations Plan, under which both Rosedale and KWBA are required to operate, and which also is provided in Appendix B.[1] The proposed project will be operated in accordance with the Long Term Operations Plan, the purpose of which is to designate specific measures to be employed to "prevent, eliminate or mitigate significant adverse impacts" resulting from project operations. A general description of the primary components of the Long Term Operations Plan is as follows:

A. Establish a Protocol for Monitoring and Reporting Groundwater Conditions:

- Conduct monitoring of groundwater conditions during years that recovery is expected from a Rosedale project, in addition to the monitoring conducted by the Kern Fan Monitoring Committee; report current groundwater levels monthly to the Rosedale Board of Directors; and make reports available to the public on Rosedale's website.
- Regularly update Rosedale's Groundwater Model to actual conditions; use the Model to predict future groundwater conditions; report modeling results to the Rosedale Board of Directors; and make modeling results available to the public on Rosedale's web site.
- Recovery in any calendar year shall not commence until the Model has been run for projected operations.

B. Implement Proactive Measures

- Rosedale's Groundwater Model will be used to predict the contribution of Rosedale's projects to groundwater level declines in the area. The Model will be used to simulate and compare the No-Project Condition to the Project Condition. The No-Project Condition is the water level that would have been at any particular well location absent the Rosedale project.
- The Model will be periodically run and updated as recovery plans become known or change in any given year.

[1] In order to allow the Kern Water Bank Authority's operations to continue pending certification of a new EIR by the Department of Water Resources (DWR), the parties in recent litigation (including Rosedale, Buena Vista Water Storage District, the Kern Water Bank Authority and its member entities) submitted to the Court a proposed *Interim Project Recovery Operations Plan Regarding Kern Water Bank Authority (KWB) and Rosedale-Rio Bravo Water Storage District (Rosedale) Project* (Interim Operations Plan), which was incorporated by the Court into its final writ of mandate. The purpose of the Interim Operations Plan is to designate specific measures to be employed to "prevent, eliminate or mitigate significant adverse impacts" resulting from project operations. The intent of the parties to the Interim Operations Plan is to mitigate and/or compensate for legitimate project impacts. The Interim Operations Plan applies to the Kern Water Bank project and all Rosedale projects which are subject to an MOU wherein the KWBA is a signatory as an adjoining entity. The Interim Operations Plan is effective September 5, 2014 and ends upon DWR's certification of a new EIR as ordered by the Court and DWR's filing of its Return Writ in the litigation. The proposed project will be subject to and consistent with the conditions of the Interim Operations Plan during this period.

- The Model will be used to identify a negative project impact (NPI) based on the comparison of No-Project Conditions and Project Conditions, and to identify the wells at risk of impact during recovery operations.

C. Establish Triggers and Mitigation Actions

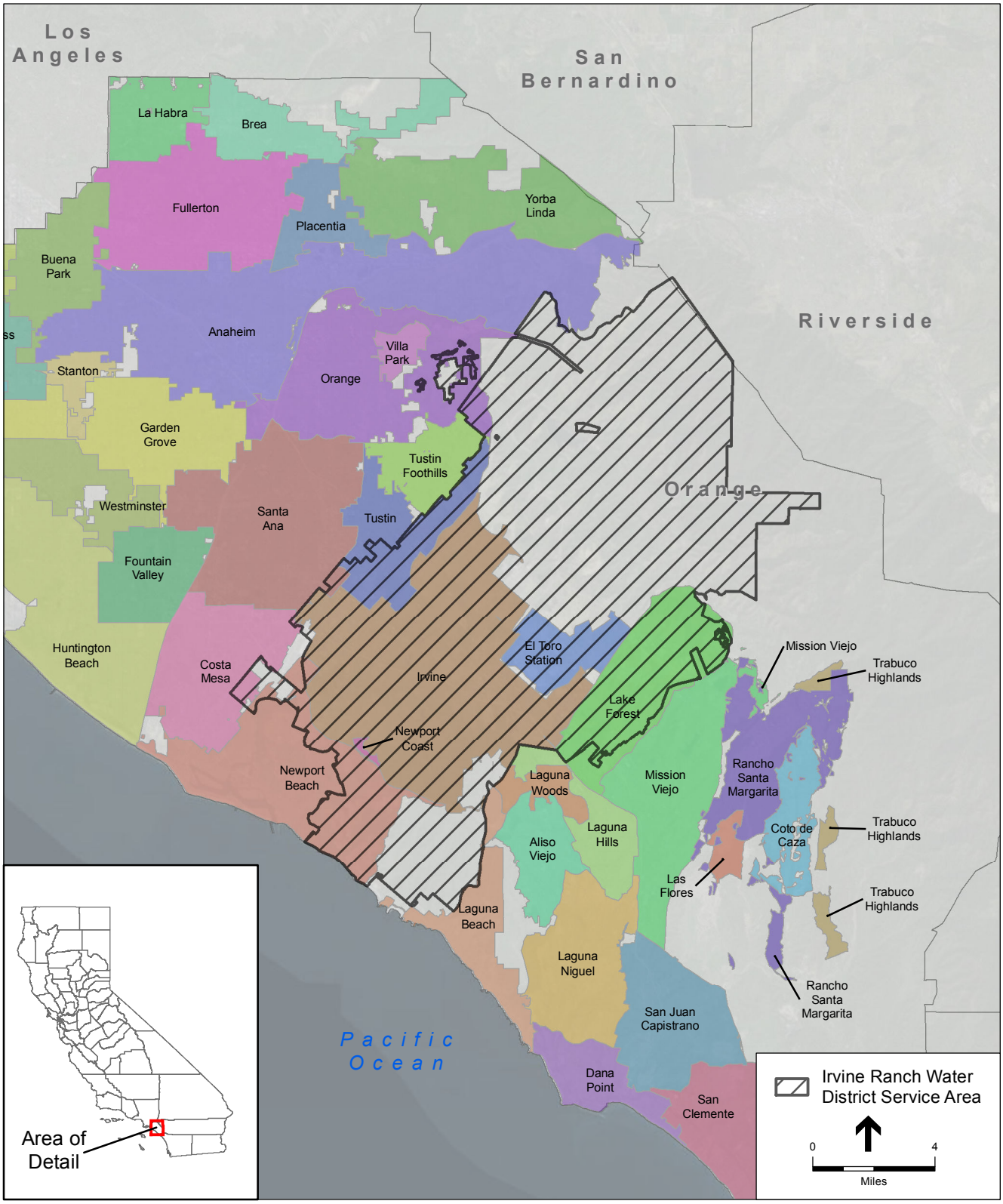
- Mitigation measures will be implemented when a NPI is triggered in years when average water levels at specified wells[2] are more than 140 feet from the surface as measured on March 31 each year. It is expected that water levels will not decline to an extent resulting in a NPI when water levels are less than 140 feet from the surface.
- A NPI is triggered when the Model results predict that groundwater levels under Project Conditions are 30 feet deeper than No-Project Conditions at a nearby existing and operative well, and the well has (or is expected to) experience mechanical failure or other operational problems due to declining water levels. Given historical fluctuations in groundwater levels in the area when other nearby groundwater banking projects are recovering, it is expected that additional declines attributable to the proposed project beyond historic low groundwater levels could result in operational problems at some existing wells.
- Agricultural Wells. The following measures would be implemented when a NPI is triggered for an operational agricultural well:
    - When the Model predicts a NPI outside the current operating range of the pump but within the potential operating range of the well, then Rosedale will provide compensation to lower the well pump to meet the landowner's needs.
    - When the Model predicts a NPI outside the current and potential operating range of the well, then Rosedale will supply an equivalent water supply to the affected landowner from an alternate source at no greater cost; provide other acceptable mitigation to the landowner; or reduce or adjust pumping as necessary to prevent, avoid, or eliminate the NPI.
- Domestic Wells. The following measures would be implemented when a NPI is triggered for a domestic well:
    - When the Model predicts a NPI such that production ceases or is likely to cease, then Rosedale will provide compensation to implement one of the following: lower the domestic submersible pump bowl setting sufficient to restore and maintain service; provide a one-time permanent connection to the nearest water service provider; or drill and equip a new domestic well. If necessary, Rosedale will provide interim in-home water supplies until one of these actions is completed.

[2] Wells 29S/25E-27N1&2, 29S/25E-25M1&2, 29S/26E-31H1&2, and 29S/25E-35G01 are the wells that will be used to monitor groundwater levels. These wells have been determined to be best suited for detecting fluctuations in groundwater levels due to project operations.

1.5.3 Irvine Ranch Water District

IRWD was established in 1961 as a California Water District pursuant to the California Water District Law (California Water Code, Division 13). IRWD provides potable and recycled water, sewage collection and treatment, and urban runoff treatment to municipal and industrial (M&I), and agricultural customers within an 115,531-acre service area in Orange County, California (**Figure 1-3**). Along with the implementation of numerous water use efficiency programs, IRWD continues to develop a diverse mix of supplies including the use of high quality groundwater, impaired groundwater, and recycled water. Currently, 78 percent of the water IRWD provides for its customers comes from local sources, including groundwater (produced from the Orange County Groundwater Basin managed by Orange County Water District), recycled water, and surface water. The remaining 22 percent of IRWD's water supply is imported by the Metropolitan Water District of Southern California (Metropolitan or MWD) and purchased by IRWD through the Municipal Water District of Orange County (MWDOC).

IRWD is further improving its water supply reliability by developing water banking facilities in Kern County. As stated above, groundwater banking allows for storage of surplus water during wet hydrologic periods for use during periods when other supply sources may be reduced or interrupted. To enhance IRWD's ability to respond to drought conditions or potential supply interruptions, IRWD is developing long-term contingency storage for the purpose of recharging and banking supplemental water which can be called upon for delivery when needed. To-date, IRWD has implemented the Strand Ranch Project and the Stockdale West Pilot Recharge Project and Emergency Project, as described below.



SOURCE: ESRI 2013; IRWD 2015

Stockdale Integrated Banking Project . 211181

Figure 1-3

Irvine Ranch Water District - Service Area

Strand Ranch Integrated Banking Project

IRWD currently participates in Rosedale's Conjunctive Use Program through its Strand Ranch Project. Strand Ranch is located in western Kern County and borders Rosedale's service area (see Figures 1-1 and 1-2). The Strand Ranch Project includes approximately 502 acres of groundwater recharge basins; seven production wells that have been completed onsite; and joint-use wells offsite that are currently being constructed by Rosedale. In the Strand Ranch Project, IRWD has the ability to store up to 50,000 AF and recover up to 17,500 AFY in accordance with its banking project terms with Rosedale. IRWD has priority rights to use the recharge basins when Rosedale is not recharging Kern River floodwaters and has first priority rights to the use of the recovery facilities. Rosedale has second priority use of Strand Ranch facilities. The water that Rosedale stores on its own behalf does not count against the 50,000 AF of storage dedicated to IRWD. Rosedale manages operation of the Strand Ranch Project on behalf of IRWD.

The Strand Ranch Project, including both the onsite components that have been completed and the above-described offsite components currently being constructed, were evaluated in the Strand Ranch Project Final EIR (Rosedale, 2008) and subsequent addenda. The evaluation included conveyance of the groundwater recovered from the Strand Ranch Project offsite wells to the CVC through existing or new pipelines connected to the Rosedale West Intake Canal. Construction and operation of these off-site recovery pipelines were evaluated in Rosedale's Final Master EIR for the Conjunctive Use Program (Rosedale, 2001) as well as the Strand Ranch Project Final EIR (Rosedale, 2008).

In addition, IRWD has obtained approval for a Coordinated Operating, Water Storage, Exchange & Delivery Agreement with Metropolitan and the MWDOC. The agreement facilitates the recovery and delivery of banked SWP water into IRWD's service area in Orange County. The recovery and delivery of non-SWP water into IRWD's service area will occur in compliance with the wheeling provisions of Metropolitan's Administrative Code.

IRWD secures and acquires the recharge water for the Strand Ranch from various sources including from the SWP, pre-1914 Kern River water, and Kern River flood water. To-date, IRWD has entered into six-year Pilot Exchange Program agreements with Antelope Valley-East Kern Water Agency (AVEK) and Carpinteria Valley Water District (CVWD) for delivery of SWP water to Strand Ranch for storage as an unbalanced exchange on a two-for-one basis. CVWD is a member agency of the Central Coast Water Authority, the State Water Contractor from which it receives rights to the use of SWP entitlement. The unbalanced exchange requires that for every 2 AF of water recharged at Strand Ranch, 1 AF is stored and available for the exchange partner and 1 AF of water is transferred to IRWD (recharge losses are accounted for). The current agreement with AVEK is for up to 5,000 AF, and the current agreement with CVWD is for up to 1,500 AF. The Pilot Exchange Program agreements have been approved by DWR, Metropolitan, Kern County Water Agency (KCWA), and the respective State Water Contractors. Recharge water was also made available through an Exchange Program with Buena Vista Water Storage District (BVWSD) for pre-1914 Kern River water. The long-term agreement for this BVWSD/IRWD Exchange Program provides for storage of high-flow Kern River water on a 2-for-1 basis (Krieger & Stewart, 2009).

In addition, IRWD owns 884 acres of Jackson Ranch in unincorporated Kings County within Dudley Ridge Water District (DRWD), which is a State Water Contractor. IRWD's land includes the associated rights to use of a SWP Table A allocation of 1,748 AF. It also includes allocation of other SWP water supplies secured by DRWD and made available to the land owners from time-to-time including but not limited to SWP Article 21 water and Turn-Back Pool water. IRWD has obtained approvals from DWR, DRWD, KCWA and MWD to store its SWP water at Strand Ranch on a two-for-one unbalanced exchange basis. Although the water belongs to IRWD, one-half of all SWP supplies stored need to be returned to and used in DRWD.

Stockdale West Pilot Recharge Project

In 2011, IRWD implemented a one-year Pilot Recharge Project on Stockdale West, which is directly adjacent to Strand Ranch (see Figure 1-1). The purpose of the Pilot Recharge Project was to determine the recharge capabilities of Stockdale West, which would assist in determining the feasibility and physical limits of a long-term water banking project at the property.

The Pilot Recharge Project facilities that were built on site include basins, earthen berms, and pre-cast concrete transfer structures to move water between the ponds. The basins were constructed to avoid the edges of the Pioneer Canal and the Cross Valley Canal (CVC), and piezometers were installed for purposes of monitoring shallow groundwater levels near the CVC. In addition, a siphon, intake structure and pipelines were constructed to convey water from the Strand Ranch recharge basins under the Rosedale West Intake Canal to the Stockdale West basins. Dirt roads were built along the perimeter of and in between all basins to provide access to facilities during operation and maintenance activities. Basin elevation generally slopes downward from southeast to northwest.

The Pilot Recharge Project operated under the terms and conditions of the existing long-term Water Banking and Exchange Agreement between Rosedale and IRWD that established the Strand Ranch Project. The one-year Pilot Recharge Project was limited to recharge of 10,000 AF of water over a one year period of time, which augmented the 17,500 AF of recharge allowed on Strand Ranch by IRWD. The water recharged was pre-1914 Kern River water made available through the Exchange Program with BVWSD. Water recharged during the Pilot Recharge Project was stored in IRWD's 50,000 AF storage account at the Strand Ranch. Water recharged during the Pilot Recharge Project will be recovered from Strand Ranch. The Pilot Project also operated under the terms and conditions of *the Operating Guidelines During Shallow Groundwater Conditions* that Rosedale and IRWD established with KCWA. The Operating Guidelines were developed to monitor for shallow groundwater conditions and to identify groundwater recharge management actions that would ensure protection of CVC facilities.

Stockdale West Ranch Emergency Project

In response to the declared State of Emergency in California due to prolonged drought conditions (January 17, 2014; April 25, 2014), IRWD implemented the Stockdale West Ranch Emergency Project in February 2015 (Notice of Exemption, February 17, 2015), which will allow for recharge of up to 10,000AF at Stockdale West using the existing recharge basins. Similar to the Pilot Project, the Emergency Project will be limited to recharge of 10,000 AF of water over a one

year period of time, which will augment the 17,500 AF of recharge allowed on Strand Ranch by IRWD. Water recharged during the Emergency Project will be stored in IRWD's 50,000 AF storage account at the Strand Ranch. Water recharged during the Emergency Project will be recovered from Strand Ranch within the 17,500 AF per year recovery limits.

References – Introduction and Project Background

Environmental Science Associates (ESA), 2011. Environmental Compliance Summary of District Operations Including Groundwater Banking and Sales Program. Prepared for Rosedale-Rio Bravo Water Storage District, April 2011.

Irvine Ranch Water District (IRWD), 2011. *Notice of Exemption, Stockdale West Ranch Pilot Project*. May 10, 2011.

Irvine Ranch Water District (IRWD), 2015. *Notice of Exemption, Stockdale West Ranch Emergency Project*. February 17, 2015.

Krieger & Stewart, 2009. *Buena Vista Water Storage District Final Environmental Impact Report for the Buena Vista Water Management Program*. Prepared for BVWSD by Krieger & Stewart, Inc., December 2009.

Pacific Institute, 2011. *Improving Water Management through Groundwater Banking: Kern County and the Rosedale-Rio Bravo Water Storage District.* Pacific Institute Farm Water Success Stories: Groundwater Banking.

Rosedale-Rio Bravo Water Storage District (Rosedale), 2001. *Final Master Environmental Impact Report for the Groundwater Storage, Banking, Exchange, Extraction & Conjunctive Use Program*. Prepared by Boyle Engineering Corporation, July 2001.

Rosedale, 2003. *Addendum No. 1 to Master Final Environmental Impact Report for the Groundwater Storage, Banking, Exchange, Extraction & Conjunctive Use Program*, May 2003

Rosedale, 2009. *Addendum No. 2 to Master Final Environmental Impact Report for the Groundwater Storage, Banking, Exchange, Extraction & Conjunctive Use Program*, September 2009.

Rosedale, 2011. *Addendum No. 3 to Master Final Environmental Impact Report for the Groundwater Storage, Banking, Exchange, Extraction & Conjunctive Use Program*.

Rosedale, 2008. *Strand Ranch Integrated Banking Project Final Environmental Impact Report*. SCH No. 2007041080. Prepared by Environmental Science Associates, May 2008.

IRWD, 2010. Addendum No. 1 to *Strand Ranch Integrated Banking Project Final Environmental Impact Report*. October 2010.

Sierra Scientific Services, 2009. *A Determination of Aquifer Recharge and Storage Capacities for the Rosedale-Rio Bravo Water Storage District, Bakersfield, California*. Prepared for Rosedale-Rio Bravo Water Storage District, September 2009.

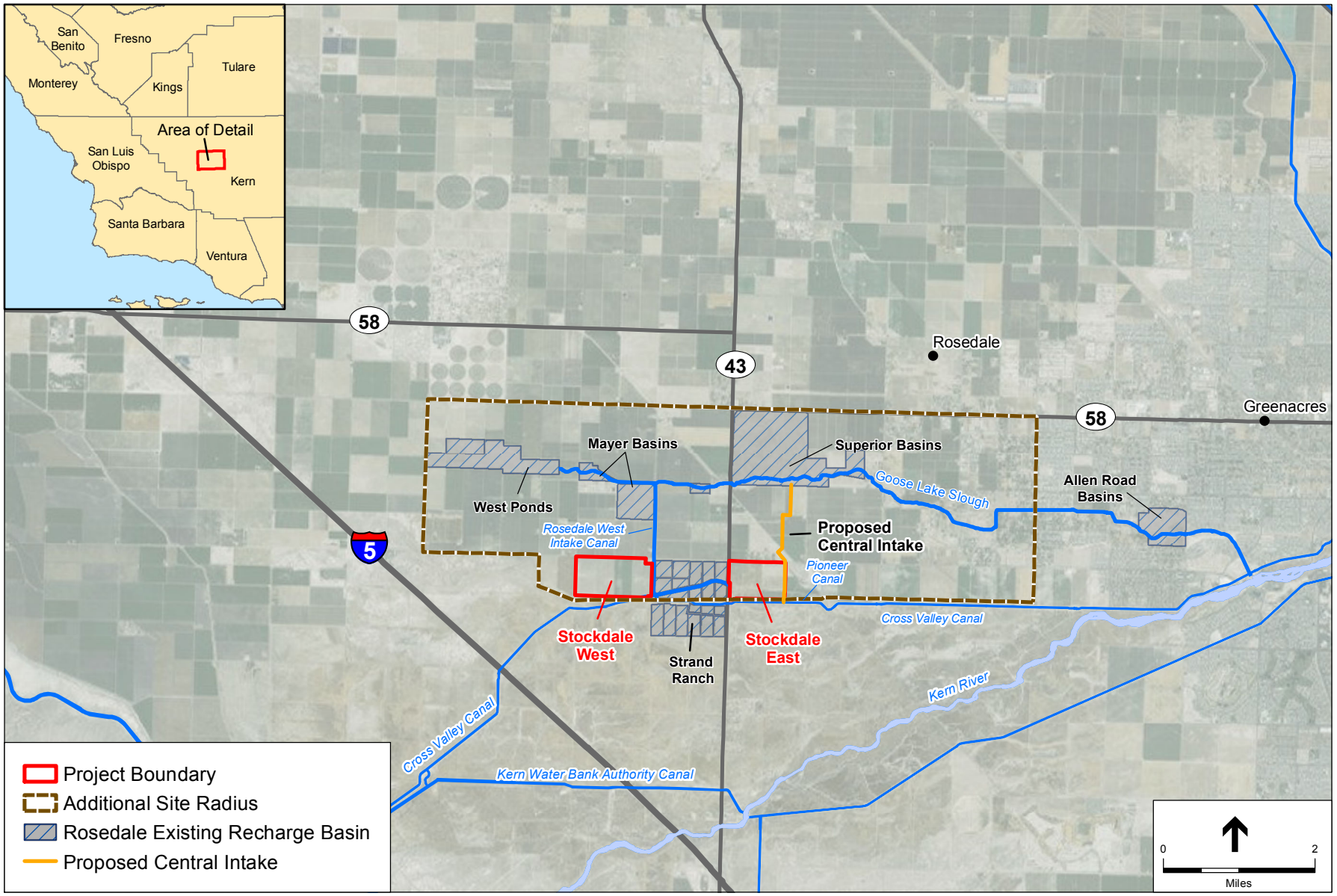
CHAPTER 2
Project Description

2.1 Overview and Project Location

The proposed project would allow both Rosedale and IRWD to more effectively utilize available storage in the local San Joaquin Valley Groundwater Basin by developing groundwater banking facilities on the Stockdale Properties. The proposed facilities would be integrated with Rosedale's existing Conjunctive Use Program, which is described in Chapter 1. The Stockdale East property is owned by Rosedale; the Stockdale West property is owned by IRWD; and the third project site would be acquired by either agency within a site radius as shown in **Figure 2-1**. Rosedale will secure an easement between and through agricultural parcels for the Central Intake Pipeline. Stockdale East and Stockdale West would be located immediately adjacent to IRWD's existing Strand Ranch Integrated Banking Project (Strand Ranch Project), which also is integrated with Rosedale's Conjunctive Use Program.

The Stockdale Properties are located in western Kern County, approximately six miles west of the City of Bakersfield, 10 miles southwest of the Friant-Kern Canal, 10 miles south of the City of Shafter, and six miles east of the California Aqueduct. Combined, Stockdale East and West are approximately 553 acres. Specifically, the Stockdale West parcel consists of approximately 323 acres of agricultural land that has been converted to groundwater recharge basins for IRWD's Pilot Recharge Project (see Chapter 1) and is located north of the Pioneer Canal and the Cross Valley Canal (CVC). The Stockdale East property also is located north of the CVC and consists of approximately 230 acres of agricultural land and an active oilfield (Ram Environmental, 2009) (Figure 2-1). Currently the crop grown on Stockdale East is alfalfa. There is a pilot groundwater banking facility on Stockdale East as well. The proposed Central Intake Pipeline alignment north of Stockdale East primarily runs between and through fields currently cultivated as almond orchards or alfalfa. The third project site has yet to be identified; however it would likely be comprised of parcels that may or may not be contiguous up to 640 acres and be characterized by agricultural land use or vacant lands. If and when the third Stockdale project site is identified, subsequent project-level environmental review will be conducted prior to implementation of project facilities.

The proposed project would result in the construction and operation of groundwater recharge and recovery facilities at each project site. The proposed project would provide for the coordinated operation of facilities at the Stockdale Properties. IRWD would have priority use of all recharge and recovery facilities and capacities located at Stockdale West. Rosedale would have priority use



SOURCE: ESRI 2013

Stockdale Integrated Banking Project . 211181

Figure 2-1

Project Location

of all recharge and recovery facilities and capacities located at Stockdale East. The first priority user at the third Stockdale project site has yet to be determined. As described in greater detail in this chapter, IRWD and Rosedale would have second priority use of each other's facilities and capacities to the extent available given defined annual recharge and recovery capacities of the project. To ensure access to an equivalent amount of second priority recharge and recovery capacity, IRWD could recharge and recover water from other Rosedale facilities in addition to Stockdale East. Rosedale would operate and maintain all project facilities in a manner similar to existing facilities within the Conjunctive Use Program. In addition, IRWD would have access to 50,000 acre-feet (AF) of Rosedale's groundwater storage capacity in Rosedale's Conjunctive Use Program.

2.2 Project Objectives

The objectives of the proposed project are as follows:

- Integrate the proposed project facilities and coordinate the proposed project operations with Rosedale's Conjunctive Use Program, including the Strand Ranch Project, to provide for maximum operational flexibility between the various programs and facilities.
- Provide additional groundwater recharge, storage, and recovery capacity in the Kern River Fan region to augment and provide operating flexibility for Rosedale's existing and future programs.
- Develop recharge and recovery capacities for each of IRWD's and Rosedale's respective properties to be available for its priority use and for the other agency's use to the extent unused capacity may be available.
- Develop additional groundwater recharge, storage, and recovery capacity to provide IRWD customers with increased water supply reliability through redundancy and diversification during periods when other supply sources may be reduced or interrupted.

2.3 Purpose and Need for the Project

There is approximately 1.7 million AF of storage available within the aquifer underlying the Rosedale service area (Sierra Scientific Services, 2009). Rosedale has sufficient storage capacity for its agricultural landowners and banking partners and also has considerable unused storage capacity. The proposed project would augment the recharge, storage, and extraction capabilities of the Conjunctive Use Program and provide greater operational flexibility assisting Rosedale in fulfilling its mission of maintaining groundwater levels within its service area.

In addition, the proposed project would enhance water supply reliability for IRWD by providing contingency storage to augment supplies during periods when other supply sources may be limited or unavailable. IRWD currently has 50,000 AF of storage associated with the neighboring Strand Ranch Project. IRWD's use of unbalanced exchange programs at Strand Ranch has effectively reduced the amount of storage available to IRWD from 50,000 AF to 25,000 AF, given the need to share storage space with exchange partners. IRWD desires to maintain a storage capacity of approximately 88,000 AF for its own use (IRWD, 2013), and therefore it is necessary

to develop or acquire additional storage and associated recharge and recovery capacity. The proposed project would augment IRWD's contingency storage allowing it to achieve its storage goals to provide the desired amount of reliability for its water supply portfolio.

Utilizing existing storage capacity in the underlying aquifer avoids the need to construct extensive surface water storage facilities elsewhere to perform the same function. In addition, the proposed project avoids overdraft conditions by eliminating the unbalanced extraction of groundwater for agricultural production. Stockdale East and West are currently not within the boundaries of a public water agency, and thus water extracted historically for agricultural irrigation has not been replenished. The proposed project is consistent with Department of Water Resources (DWR) water management goals. In the *California Water Plan Update 2013*, DWR has renewed its commitment to integrated water management as a means to provide reliable, sustainable and secure water resources and management systems, which includes improving water supply reliability, reducing groundwater overdraft and land subsidence, and protecting water quality and environmental conditions.

On January 17, 2014, Governor Jerry Brown declared a State of Emergency due to the grossly diminished statewide supply of water. Again on April 25, 2014, the Governor proclaimed a continued State of Emergency due to prolonged drought conditions, and identified statewide directives to bolster California's efforts to manage and conserve water efficiently under prolonged drought conditions. In his directives, the Governor highlighted the imperativeness of supporting conservation measures pertaining to groundwater resources. By augmenting the recharge, storage and future extraction capacities of Rosedale and IRWD, the proposed project supports Governor Jerry Brown's conservation initiatives by providing water supply reliability for future conditions. As the residual impacts of the California drought continue into the future, the proposed project will assist in providing a reliable water source to ameliorate effects of the 2014 drought.

2.4 Description of Proposed Project

The proposed project sites consist of the following: Stockdale East; Stockdale West; a third project site that may be made up of non-contiguous parcels and that has yet to be specifically located; and the Central Intake Pipeline alignment. There is approximately 26,000 AF of available storage under Stockdale West and approximately 18,400 AF of available storage under Stockdale East (Thomas Harder & Co., 2015). This is additive to Rosedale's existing 1.7 million AF of storage that underlies its services area, given that Stockdale East and Stockdale West are outside of Rosedale's boundary. However, Rosedale would manage the Stockdale Properties and their associated storage along with the Conjunctive Use Program. Once the third Stockdale project site has been identified, the associated storage underlying the site would be determined. Based on characteristics of Stockdale East and West, a third proximate site of up to 640 acres may have storage of approximately 51,200 AF. In addition to storage under Stockdale West, IRWD will have access to an additional 50,000 AF of storage in Rosedale's Conjunctive Use Program ("Acquired Storage Account"). Water put into storage under the Acquired Storage

Account would be recharged either through the proposed project or Strand Ranch Project or coordinated use of other Rosedale facilities.

Recharge capacities for the Stockdale Properties are estimated to be approximately 27,100 acre-feet per year (AFY) for Stockdale West and approximately 19,000 AFY for Stockdale East (Thomas Harder & Co., 2015). Recharge capacity is based on an estimated infiltration rate of 0.28 feet per day for 365 days (Thomas Harder & Co., 2015). Recovery facilities would be designed to extract approximately 11,250 AFY at Stockdale West and approximately 7,500 AFY at Stockdale East. Once the third Stockdale project site has been identified, the associated recharge and recovery capacities would be determined. Based on characteristics of Stockdale East and Stockdale West, a third proximate site of up to 640 acres may have recharge capacities of approximately 52,200 AFY and recovery of approximately 22,500 AFY. All groundwater banking facilities on Stockdale West would be owned by IRWD and operated and maintained by Rosedale for the duration of the proposed project. All groundwater banking facilities on Stockdale East would be owned, operated, and maintained by Rosedale.

The proposed Central Intake Pipeline would connect the Goose Lake Slough to the CVC and will serve as a conveyance for delivery of recharge water to Stockdale East and the existing Superior Basins, and for delivery of water pumped from Stockdale East wells and other Rosedale wells on the Superior Basins to regional conveyance facilities via the CVC. The Central Intake Pipeline would generally run along and between existing agricultural parcels, along the eastern edge of the Stockdale East property, and up to a new pump station and CVC turnout/turn-in facility. The Central Intake Pipeline will be owned and operated by Rosedale. The following sections describe the proposed facilities in greater detail.

2.4.1 Recharge Facilities

As described in Chapter 1, in 2011, IRWD constructed four recharge basins that total approximately 265 acres (or 82 percent) over approximately 323 acres of the Stockdale West property as part of the one-year Pilot Recharge Project. The Pilot Recharge Project facilities include basins and earthen berms consisting of varying shape, size and depth. The existing basin layout avoids the edges of the Pioneer Canal and the CVC as shown in **Figure 2-2**. The proposed project would utilize the existing recharge basins on Stockdale West and other recharge basins located offsite within Rosedale's service area, including Stockdale East and other existing basins as described below. No other recharge basins would be constructed on Stockdale West. However, embankments and additional transfer structures may be constructed to divide the existing basins into smaller impoundments or to enhance performance as may be necessary in the future. Certain conveyance improvements may be constructed to facilitate interconnection with Rosedale's conveyance system, the CVC, the Pioneer Canal and the Strand Ranch (see Section 2.4.4 below).

On Stockdale East, there is an existing groundwater banking pilot facility that consists of a 15 to 20 acre recharge basin. This basin would likely remain unchanged and would be integrated with additional facilities developed onsite. Stockdale East would be further developed with recharge facilities, including basins and berms, occupying as much as 200 acres (or 87 percent) of the property. Recharge facilities would consist of up to eight recharge basins of varying shape, size,

and depth. The proposed preliminary layout of the basins is shown in Figure 2-2, although the actual configuration of basins could vary. Basins would be formed by excavating and contouring existing soils and using excavated soils to form earthen berms. Typical basin berms would be three to five feet and extend up to six feet above ground level. Water depth in each basin would be approximately three feet; there would be a minimum of one foot of freeboard when the basins are filled to capacity.

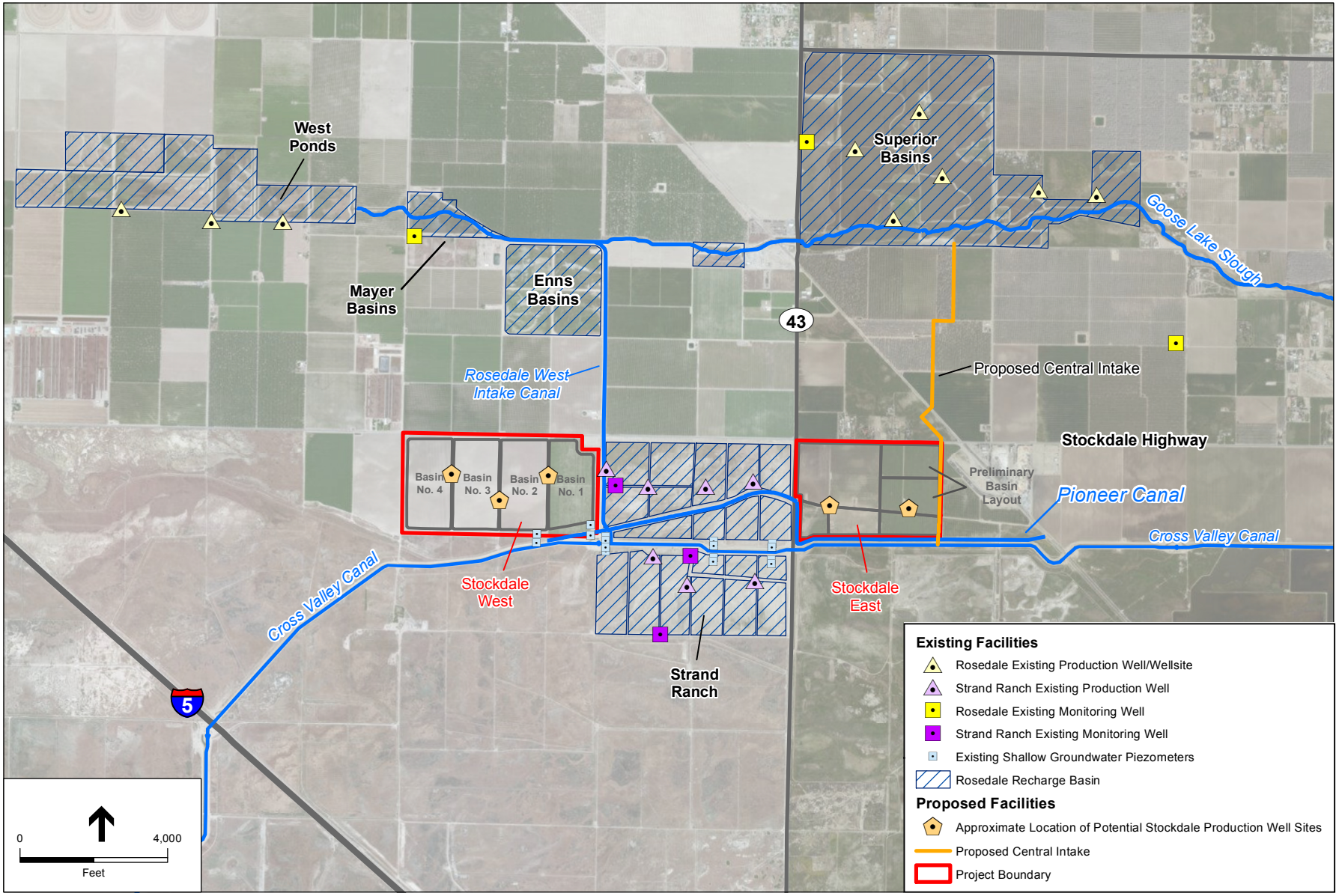
Dirt roads would run along the perimeter of and in between all basins to provide access to facilities during operation and maintenance activities. Dirt roads would be up to 20 feet wide. Basin elevations would generally slope downward from east to northwest. The bottom elevations of the basins would range from approximately 328 feet above mean sea level (AMSL) on the eastern edge to 322 feet AMSL in the northwest corner of Stockdale East. Recharge water would enter the basins through a new CVC turnout and pump station associated with the Central Intake Pipeline (see Section 2.4.4 below). The basins would be connected by check structures to allow recharge water to flow by gravity among basins, flowing generally from east to northwest, using the elevation gradient.

The Stockdale East property currently is actively cultivated for agricultural purposes but also contains an active oilfield (Ram Environmental, 2009). The oilfield may remain active during project implementation and operation. As such, the basins also would accommodate existing and future drill islands to maintain access to underlying mineral rights. The oilfield facilities include five active oil wells with pumping units, one tank farm, one produced water injection well, and one idle and two plugged wellheads onsite. The typical construction of the oil wells in the area includes an upper casing and outer cement seal from the ground surface to approximately 500 feet below ground surface (ft bgs) (Thomas Harder & Co., 2014; see **Appendix H**). Of the two plugged oil wells on Stockdale East, one has a cement plug between 959 and 1,005 ft bgs, and the other has two plugs between 1,694 and 1,926 ft bgs and 6 and 40 ft bgs (Thomas Harder & Co., 2014).

The third Stockdale project site also may be developed with new recharge facilities, similar to those described for Stockdale East and Stockdale West. It is anticipated that recharge rates at the third property would be comparable to neighboring banking projects. The basins at all three Stockdale property sites would be managed to allow agricultural land uses to continue, such as annual farming or grazing.

Other Existing Recharge Facilities

The proposed project would integrate the operation of facilities at all three Stockdale Properties with Rosedale's other existing facilities and the Strand Ranch facilities, and operations would be coordinated with Rosedale's Conjunctive Use Program. As part of the Conjunctive Use Program, IRWD would be able to recharge water offsite at Rosedale's other existing facilities.



SOURCE: ESRI, 2014.

Stockdale Integrated Banking Project . 211181

Figure 2-2

Proposed Project Facilities

2.4.2 Recharge Water Supplies

Recharge water for the proposed project would be secured and acquired by Rosedale and IRWD from various sources, potentially including federal, state, and local supplies through transfers, balanced and unbalanced exchange agreements, purchase or temporary transfers, or other means as available. Sources could include the Central Valley Project (CVP), the State Water Project (SWP), high-flow Kern River water depending on annual availability and appropriative (pre-1914 and post-1914) water rights. It is the intent of this EIR to evaluate impacts of recharging water from the sources described below to the extent that they are reasonably foreseeable. Should water from other sources not suggested below be acquired for recharge, additional analysis may be required subject to the discretion of Rosedale and IRWD.

Central Valley Project

The Central Valley Project (CVP) is a network of dams, power plants, and canals that provides water supply reliability to the Central Valley in periods of drought. The Bureau of Reclamation makes excess non-storable CVP Section 215 flood water available during wet years. If conveyance is available, this surplus CVP water could be delivered to the proposed project from the Friant-Kern Canal through the CVC. Rosedale is a fourth priority non-CVP South of Delta Contractor that can take CVP water under certain conditions. IRWD does not have priority to CVP water, and would not be able to export recharged Section 215 water to its customers in Orange County without a consolidated place of use, including any necessary agreements, or implementation of an exchange.

State Water Project

DWR delivers water to 29 State Water Contractors, including 21 south of the Sacramento River Delta, that are served from the California Aqueduct. State Water Contractors can order water up to their Table A allocation under a given allocation set by DWR, even if the water is not needed in that year, and this excess water can be stored outside the contractor's place of service for future use. Rosedale currently receives SWP water for its Conjunctive Use Program through a water supply contract with Kern County Water Agency (KCWA), one of the State Water Contractors.

During wet hydrologic years, DWR may declare Article 21 water available, which is uncontrolled water that cannot be stored in State reservoirs. Article 21 supplies are available in short duration, and, if conveyance capacity exists, can be purchased and stored for future use. Rosedale or IRWD would purchase excess Article 21 water through its State Water Contractor for delivery to existing project recharge facilities using the CVC when such water is available, subject to CVC capacity and as permitted by Rosedale, KCWA and IRWD's State Water Contractors.

Under certain contracts and/or guidelines, DWR allows for the exchange of stored water on an even or unbalanced basis. Unbalanced exchanges are permissible by DWR on a maximum unbalanced rate of two-for-one, such that in return for storage the original water contractor leaves behind up to half of the water stored. SWP water available for exchange could be acquired for the proposed project. The banking of water through the execution of even or unbalanced exchanges

or other transactions approved by DWR would require the cooperation and agreement of the exchange State Water Contractor, DWR, KCWA, and MWD.

Metropolitan Water District of Southern California

IRWD currently receives water supplies for its service area from MWD. Water is provided to IRWD through Municipal Water District of Orange County (MWDOC), the regional wholesale member agency of MWD. MWD sells water under a variety of terms and conditions and at different prices reflecting these conditions. For example water can be delivered to IRWD as either treated potable water or untreated raw water. Water may also be delivered for agricultural use or groundwater replenishment. MWD has also entered into a variety of cooperative delivery and storage conjunctive use arrangements with many of its member agencies who have groundwater storage assets, including the coordinated operating agreement with IRWD and MWDOC described below in Section 2.6.4, relating to the Strand Ranch.

With MWD approval, IRWD could take delivery of water purchased from MWD through MWDOC for storage and later conveyance to IRWD. Delivery would be made from the California Aqueduct via the CVC to Stockdale West, Stockdale East, the third Stockdale site, the Strand Ranch Project, or other Rosedale facilities and could be delivered through exchange. The delivery would be subject to supply and conveyance capacity availability and approval by MWD and KCWA. IRWD could also purchase surplus water supplies when approved and available from MWD through MWDOC for delivery to the proposed project.

Appropriative Water Rights

Surface water rights, including pre-1914 and post-1914 appropriative water rights, are held by water districts and parties throughout California. These water rights can be transferred to other parties as long as legal users of water are not injured (per Water Code Sections 1706 and 1702). The SWRCB supervises such changes to post-1914 appropriative water rights, but not pre-1914 appropriative water rights. In addition, for transfers of post-1914 appropriative water rights, the SWRCB must make a finding that the transfer will not result in unreasonable effects on fish or wildlife or other in-stream beneficial uses (SWRCB, 1999). The “no unreasonable effect” test is not the same as the evaluation of significant impacts under CEQA (SWRCB, 1999). Should the use of such appropriative water rights require evaluation of impacts to legal users and other environmental considerations, additional analysis may be required.

Rosedale currently receives Kern River water when it is available for groundwater recharge through water service agreements with the City of Bakersfield and from Buena Vista Water Storage District and other Kern River interests through banking and temporary water service agreements. IRWD currently receives pre-1914 Kern River water at the Strand Ranch Project through an Exchange Program from Buena Vista Water Storage District through the Buena Vista Water Storage District Water Management Program. This Exchange Program may be extended to provide for the recharge of pre-1914 Kern River water on the Stockdale Properties.

Kern River water is also available during wet years when the U.S. Army Corps of Engineers (USACE) mandates release of water from Isabella Reservoir for flood control purposes. The Kern

River Watermaster records the amount of water released daily from the Isabella Reservoir into the Kern River.[3] During periods of mandatory release, releases from the Isabella Reservoir may be available for diversion.

Kern River water that may be available for Rosedale and/or IRWD under this project could occur when water (1) is offered to all takers willing to sign a "Notice/Order"; or (2) is offered to the Kern River/California Aqueduct Intertie for disposal; or (3) is expected to flood farm acreage; or (4) is expected to be delivered into the Kern River Flood Channel for disposal out-of-county. Kern River water would be conveyed to the proposed project through the CVC, Pioneer Canal or the Goose Lake Slough, or any other facility available to Rosedale, subject to any necessary approvals or agreements.

2.4.3 Recovery Facilities

The proposed recovery facilities would be designed and located to minimize potential impacts to wells pumping on adjacent properties. The project design proposes constructing three wells on Stockdale West for an anticipated annual recovery capacity of 11,250 AF and two wells on Stockdale East for an anticipated annual recovery capacity of 7,500 AF (see **Appendix E**; Thomas Harder & Co., 2015). Once the third Stockdale project site is identified, extraction capacity and the number of wells would be identified for the third site. However, based on characteristics of Stockdale East and Stockdale West, a third proximate site of up to 640 acres may have recovery capacity of approximately 22,500 AFY.

Each well would be designed to pump groundwater at a recovery rate of approximately 2,800 gallons per minute (6.2 cubic feet per second (cfs)). Actual recovery rates for each well may be slightly more or less based on aquifer conditions at each well site. If higher rates are achieved for the first few wells installed, fewer wells may be needed. Conversely, if less favorable production is realized, additional wells may be needed.

All production wells would be large-diameter (18 to 24 inches) steel-cased wells with completion intervals between approximately 200 and 700 feet below ground surface (bgs) and could be deeper depending on water quality and expected aquifer yield. Wellheads would consist of riser pipes, discharge pipes, wellhead motors, pumps, and other appurtenances. Wellheads would be protected by lockable, roofed, metal-mesh pump houses that are up to approximately 12 feet in height and constructed on square concrete pads. Typical wellhead facilities are shown in **Figure 2-3**. The existing agricultural wells on Stockdale East and Stockdale West could be used as production wells or monitoring wells in addition to the proposed new wells. The agricultural wells could contribute to operational flexibility by providing additional recovery capacity and could be used for water quality blending purposes, if needed.

[3] Kern County Planning Department, Kern River Valley Specific Plan, July 2011, available on-line at: http://www.co.kern.ca.us/planning/pdfs/KRVSP/Chp1Introduction2.pdf. Accessed on October 19, 2012.

SOURCE: Irvine Ranch Water District

Stockdale Integrated Banking Project . 211181

Figure 2-3
Sample Wellhead and Housing
at Strand Ranch

The wells would have approximately 1/4 to 1/3 mile (1,320 to 1,760 feet) normal spacing and the wells located on Stockdale East and Stockdale West would be located at a minimum of an 880-foot setback from the southern property lines, which form a boundary with the Kern Water Bank Authority (KWBA). Figure 2-2 identifies potential and approximate well locations on both Stockdale West and Stockdale East properties. Location of wells on all three Stockdale Properties may change during final design.

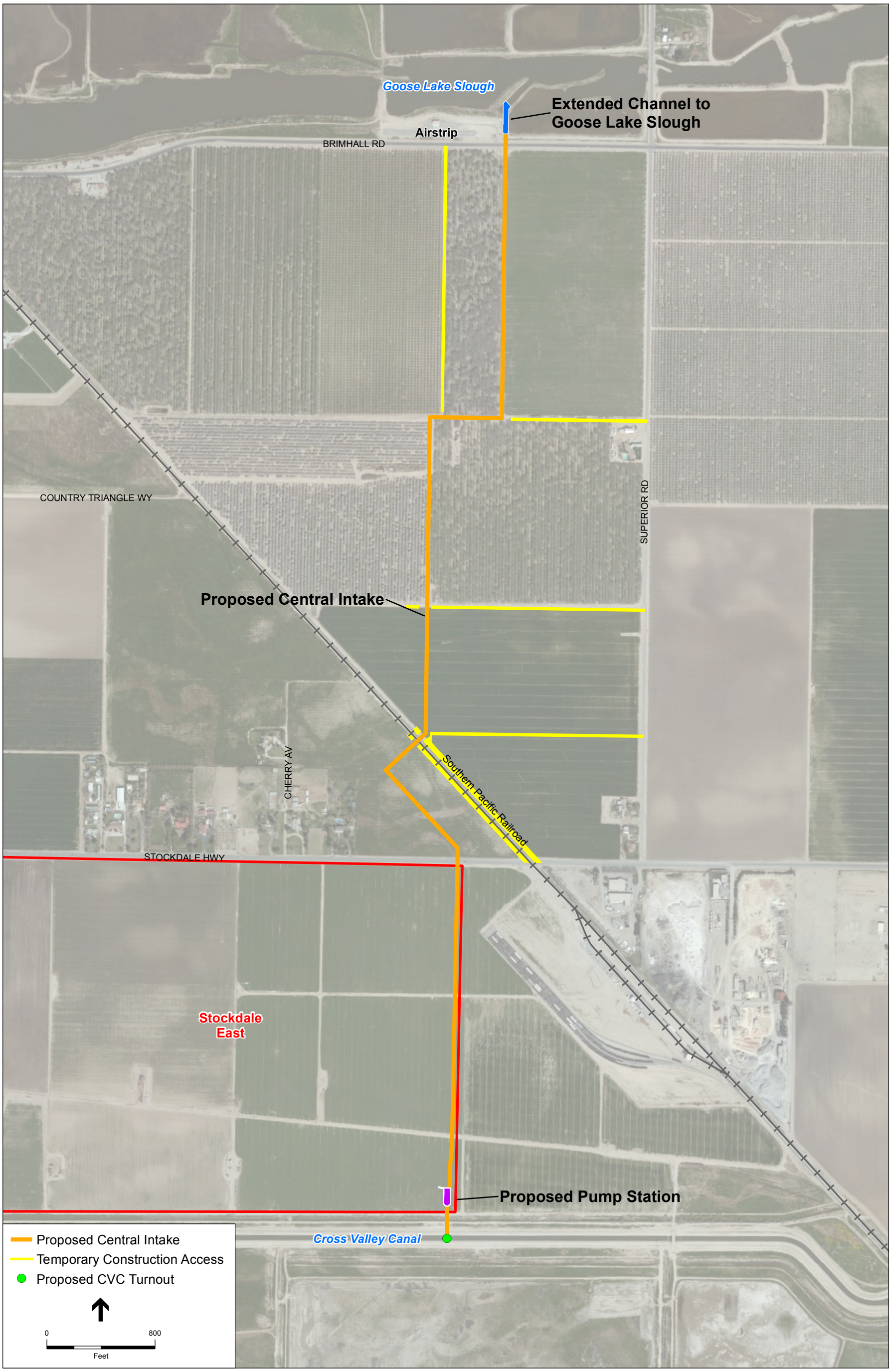
Integrated Operation with Other Existing Extraction Facilities

The proposed project provides flexibility for IRWD and Rosedale to integrate the operation of the project recovery facilities at all three Stockdale Properties with other recovery facilities in Rosedale's Conjunctive Use Program, including other existing Rosedale facilities and the Strand Ranch Project onsite and offsite facilities. As part of this integration, to optimize operational flexibility of groundwater and facility management, Rosedale could recover groundwater on behalf of itself and/or IRWD, at any facility available to Rosedale within its Conjunctive Use Program.

2.4.4 Conveyance Facilities

Water would be conveyed to the proposed project via the CVC, Rosedale's West Intake Canal, Goose Lake Slough, or the proposed Central Intake Pipeline. In addition, other regional facilities may be used to move water to/from the project, such as the Pioneer Canal, subject to any necessary approvals. Once the third Stockdale project site is identified, conveyance options would be determined for the third site. If the third Stockdale project site requires additional conveyance facilities, those facilities would be identified and evaluated in subsequent CEQA evaluations.

Water would be conveyed to Stockdale East through the proposed Central Intake Pipeline, which would be a bi-directional underground pipeline, up to 72 inches in diameter. The pipeline alignment would run from Goose Lake Slough, south across Brimhall Road, along, between and through existing agricultural parcels, across the Southern Pacific Railroad and Stockdale Highway, and along the eastern edge of Stockdale East, connecting to a new pump station and Central Intake Turnout at the CVC (**Figure 2-4**).. The permanent right-of-way for the pipeline would range between 30 and 60 feet. The inlet structure at Goose Lake Slough would include rip-rap for erosion protection. The Central Intake pump station would be located on Stockdale East and would connect to the proposed Central Intake Turnout through a pipeline under the Pioneer Canal. The pump station footprint would be approximately 60 feet by 50 feet with an approximate height of 14 feet. The pump station would be necessary to lift water a few feet for conveyance purposes. The pump station would include an outlet to the Stockdale East recharge basins, which also would include rip-rap for erosion protection. The proposed Central Intake Turnout at the CVC would include up to a 72-inch electrically-actuated slide gate and other appurtenances. Construction of the turnout would require approval from KCWA; approval may also be required from the KWBA for constructing the pipeline under the Pioneer Canal.



SOURCE: ESA

Stockdale Integrated Banking Project . 211181

Figure 2-4

Proposed Central Intake Pipeline

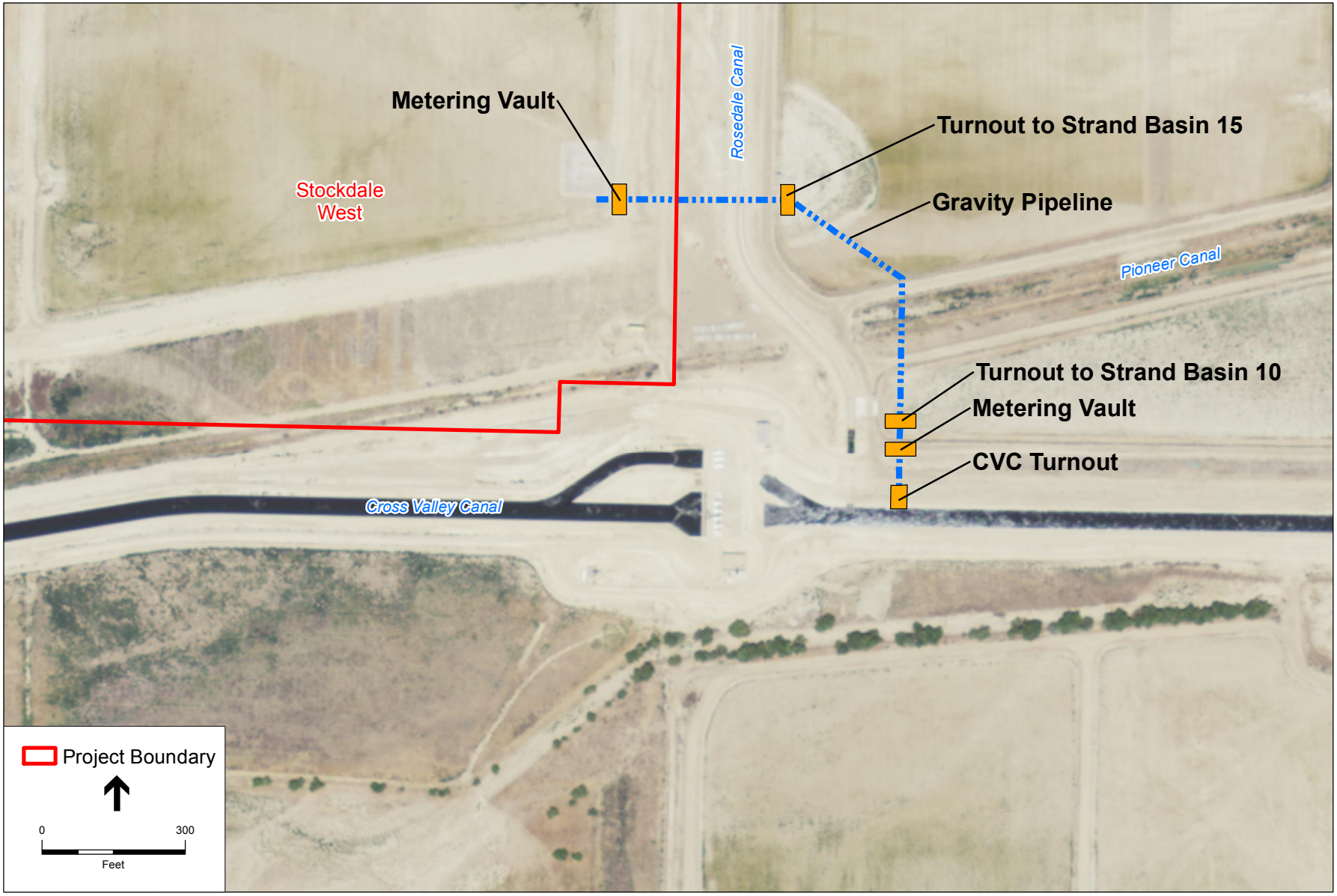
This page left intentionally blank

The conveyance capacity of the Central Intake Pipeline would be sufficient to convey water to/from Stockdale East for recharge/recovery, with additional capacity available to Rosedale for its other Conjunctive Use Program partners and to IRWD. The Central Intake Pipeline would provide conveyance capacity to support recovery operations for IRWD and Rosedale from the offsite well component of the Strand Ranch Project and for Castaic Lake Water Agency (CLWA) from the wells in the Superior Basins as part of the 2014 Drought Relief Project.[2] In addition, the Central Intake Pipeline would have capacity to pump water north to Rosedale's recharge facilities along Goose Lake Slough, up to approximately 10,000 AFY.

Water could be conveyed to Stockdale West through the existing Strand Ranch facility using an existing siphon and intake structure that connects the two properties. This conveyance strategy would utilize the existing CVC Strand Ranch North Turnout and water would flow by gravity to Stockdale West. In addition, a new CVC turnout would be constructed to convey water directly to the Stockdale West recharge basins and to the Strand Ranch recharge basins. This proposed Stockdale West Turnout facility would be located at the CVC just east of the existing CVC Pump Station #2 at the Strand Ranch property and run adjacent to the Rosedale West Intake Canal (**Figure 2-5**). The proposed turnout would consist of an approximately 60-inch electrically-actuated slide gate and other appurtenances. From the Stockdale West Turnout, a 60-inch reinforced concrete pipe would be installed on IRWD-owned land, running beneath the Pioneer Canal, Strand Ranch basins, and Rosedale's West Intake Canal, and connecting to the easternmost recharge basin on Stockdale West and to the closest recharge basin on Strand Ranch. Conveyance of water from the CVC to Stockdale West would be completely gravity driven. Construction of the Stockdale West Turnout would require approval from KCWA; approval may also be required from the KWBA for constructing the pipeline under the Pioneer Canal. Other improvements to the Rosedale West Intake Canal, Pioneer Canal or CVC turnouts may be made to improve the ability to deliver water to Stockdale West and Strand Ranch.

Groundwater recovered from the production wells on Stockdale East and Stockdale West would be conveyed to the CVC through new recovery pipelines that would be below ground, running along the dirt roads between recharge basins or buried in the basin bottoms, with exact locations subject to final well placement and design. The recovery pipelines on Stockdale East would connect to the proposed Central Intake pump station; recovery pipelines on Stockdale West could connect to the Rosedale West Intake Canal through a new turn-in structure adjacent to the southeast corner of Stockdale West.

[2] CLWA has evaluated the 2014 Drought Relief Project under separate CEQA proceedings per CLWA's Notice of Determination dated October 22, 2014. The offsite well component of the Strand Ranch Project also is evaluated under separate CEQA proceedings per IRWD's Notice of Determination dated November 1, 2010.



SOURCE: ESRI

Stockdale Integrated Banking Project . 211181

Figure 2-5

Proposed Stockdale West Gravity Turnout

2.5 Project Construction

2.5.1 Recharge Facilities

Recharge facilities would be constructed on Stockdale East and likely the third Stockdale project site. Construction of the proposed recharge facilities would include the following phases: site clearing and demolition; excavation and stockpiling; construction of earthen berm levees and basins, cut-off walls, conveyance and transfer channels, rip-rap protection, and pipelines; and site restoration. The site clearing and demolition phase would include demolition of existing irrigation piping systems onsite, as necessary. Up to twenty workers would be required on-site at one time to implement each construction phase. The staging areas, including construction parking, would be located on-site within the boundaries of the Stockdale Properties.

Recharge basins would be constructed by excavating and contouring each basin to a depth of approximately five feet (**Figure 2-6**). The excavated soils would be used to form earthen berm levees to contain each basin. The basins would be connected by welded steel or concrete transfer structures with 24- to 72-inch diameter pipe culverts **(Figure 2-7)**.Supply channels would be constructed by excavating below existing ground surface. Any necessary supply channels would be earthen or lined channels, and turnout structures between the supply channels and recharge basins would consist of 24- to 72-inch culverts.

The recharge basins and supply channels would be designed in an effort to balance earthwork on site, such that all excavated soils are redistributed and utilized to construct the project facilities, requiring no imported materials and leaving no excess materials. If excess soils are produced, they would be either sold or transported to an appropriate location. Demolition and construction debris would be removed from the project site and transported to an appropriate landfill facility that accepts construction waste material.

2.5.2 Recovery Facilities

Three new recovery wells would be constructed on Stockdale West; and two new recovery wells would be constructed on Stockdale East. In addition, the number of wells to be constructed on the third Stockdale project site will be determined once the location is identified. On-site materials would be used to construct earthen well pads. Wells would be drilled and constructed using a standard drill rig. The aboveground wellheads, motor control centers and pump houses would be installed and connected to transformers installed on the project sites. The recovery wells would be connected to a conveyance system of underground pipelines to deliver pumped groundwater to the CVC. Installation of the recovery well conveyance system would require trenching to a depth of about seven feet below existing ground surface. Construction staging would be located on-site within the boundaries of the Stockdale Properties.

SOURCE: IRWD

Stockdale Integrated Banking Project . 211181

Figure 2-6
Construction of Recharge Basins

SOURCE: IRWD

Stockdale Integrated Banking Project . 211181

Figure 2-7

Examples of Basin Transfer Structures

2.5.3 Conveyance Facilities

The Central Intake Pipeline and pump station would be constructed using typical open trench construction methods, with the exception of crossing Stockdale Highway and the Southern Pacific Railroad, where jack and bore methods would be used to tunnel under and avoid disruption of surface features. Excavation up to 12 feet deep would be required; and excess soils would be either sold or transported to an appropriate location for disposal or reuse. Construction staging would be located on-site within the boundaries of the Stockdale Properties and/or the temporary construction easement for the pipeline (Figure 2-4).

The proposed Stockdale West Turnout and Central Intake Turnout would be constructed within the CVC right-of-way and subject to approval by KCWA. To avoid disruptions to CVC operations, cofferdams would be required during turnout construction. Cofferdams are temporary watertight structures that would allow for a portion of the CVC to be dewatered during construction of the turnouts and allow flows to continue passing through the CVC channel. The pipelines leading from both turnouts would be installed using open trench construction. Crossing the Pioneer Canal would be subject to approval by KWBA.

2.5.4 Construction Equipment

Construction of the proposed project would require heavy equipment onsite at the Stockdale Properties. 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
- Compactor
- Water trucks
- Flat-back delivery truck
- Earth movers
- Bulldozers
- Excavators
- Drill rigs and tanks

2.5.5 Project Construction Schedule

Construction of the proposed facilities on Stockdale East and Stockdale West is anticipated to begin in summer 2015 and continue in approximately six-month phases, with a total of four to six sequential phases. Stockdale East could be ready to receive water for recharge by fall 2015, subject to variation of the construction schedule. Construction of facilities on the third Stockdale project site would follow similar phasing but would occur at a later date, subsequent to Stockdale East and Stockdale West.

2.6 Project Operation

2.6.1 Recharge

Reciprocal Use

IRWD and Rosedale shall have reciprocal use of the project and Conjunctive Use Program recharge facilities, subject to mutually agreeable terms and conditions. It is expected that IRWD would have priority use of all recharge facilities and capacities located at Stockdale West. Rosedale would have the use of these same facilities and unused recharge capacities at Stockdale West to the extent that it is available after IRWD's use. Similarly, Rosedale would have priority use of all recharge facilities and capacities located at Stockdale East. IRWD would have the use of the facilities and unused recharge capacities at Stockdale East and other Rosedale recharge facilities to the extent that it is available after Rosedale's priority use, subject to approval of Rosedale and other third parties as required. The priority and reciprocal use of the recharge facilities at the third Stockdale project site is yet to be determined and would be subject to Rosedale and IRWD developing mutually agreeable terms and conditions.

General Operations

Rosedale would operate all recharge basins at the Stockdale Properties in a manner similar to existing basins in the Conjunctive Use Program. The recharge basins would be filled when water supplies become available, which could be highly variable from year to year, as evidenced by fluctuations in water deliveries to the Conjunctive Use Program in the recent past. For example, in 2008, there were no water deliveries for banking in Rosedale's existing program, while in 2011, banking water deliveries totaled approximately 245,000 AF for recharge. In years when water is available, it is estimated that active recharge operations could occur for as few as one to as many as twelve months per year.

Since the proposed project facilities would be integrated into Rosedale's Conjunctive Use Program, both Rosedale and IRWD would be able to recharge water offsite at other existing facilities to facilitate effective resource management within Rosedale's service area.

2.6.2 Recovery

Reciprocal Use

IRWD and Rosedale shall have reciprocal use of the Conjunctive Use Program recovery facilities, subject to mutually agreeable terms and conditions. It is expected that IRWD would have priority use of all recovery facilities and capacities located at Stockdale West. Rosedale would have use of these same facilities and unused recovery capacities at Stockdale West to the extent that they are available after IRWD's use. Rosedale would have priority use of all recovery facilities and capacities located at Stockdale East. IRWD would have use of these same facilities and unused recovery capacities at Stockdale East and other Rosedale facilities to the extent that they are available after Rosedale's use, subject to approval of Rosedale and other third parties as required. The priority and reciprocal use of recovery facilities at the third Stockdale Property project site is

yet to be determined and would be subject to Rosedale and IRWD developing mutually agreeable terms and conditions.

General Operations

The proposed project would provide flexibility for Rosedale to pump from any combination of wells on the Stockdale Properties and other wells within the Conjunctive Use Program (including the Strand Ranch Project onsite and offsite wells) to meet recovery obligations for both IRWD and Rosedale. Extraction would be limited to the amount previously recharged less losses and will be specified in agreements between IRWD and Rosedale.

In-Lieu Recovery by Exchange

In addition to direct recovery through extraction, Rosedale could recover the banked water by way of exchange. An exchange in-lieu of recovery may be accomplished through the use of SWP or other supplies through various water management programs and/or other surface supplies available. The exchange of surface supplies shall be subject to the approval of those entities with discretionary authority over such supplies.

2.6.3 Recovery Scenarios

Rosedale would recover water from the proposed project as needed to meet existing or future commitments under its Conjunctive Use Program. It is expected that banked supplies would be conveyed to IRWD when needed to return water to its program partners and potentially during times when IRWD's imported and/or local supplies are interrupted or curtailed. IRWD's participation in the proposed project recognizes IRWD's need, in the event of an interruptible or short-term water shortage, for additional storage and recovery capacity to provide for improved reliability and redundancy in its supplies.

2.6.4 Conveyance

Water recovered from the proposed production wells would be conveyed via the CVC for subsequent conveyance to IRWD, IRWD's program partners, and Rosedale's program partners. Before introduction of pumped groundwater into the California Aqueduct, IRWD and Rosedale would comply with any existing CVC as well as DWR's water quality policy provisions for introduction of local water into the California Aqueduct and the current water quality criteria in effect at the time of delivery.

The State Water Contractor that imports water to IRWD's service area is MWD. MWD would access water from the California Aqueduct at Lake Perris where it could be conveyed to IRWD through a turnout approved by MWD. For example, water could be delivered to MWD's Diemer Filtration Plant located north of Yorba Linda or delivered untreated to Irvine Lake through the Santiago Lateral. The two major pipelines that deliver water from the Diemer Filtration Plant to the IRWD service area are the Allen McColloch Pipeline and the East Orange County Feeder No. 2. Water delivered to IRWD by MWD could occur by exchange.

Imported water is provided to IRWD through Municipal Water District of Orange County (MWDOC), the regional wholesale member agency of MWD. In 2011, IRWD, MWD and MWDOC entered into a Coordinated Operating, Water Storage, Exchange and Delivery Agreement to facilitate delivery of SWP water banked at Strand Ranch to IRWD's service area. The Agreement could be amended, as needed, to include the proposed project as well. Under the Agreement, IRWD can provide banked water to MWD at a Kern County delivery point into the California Aqueduct (via the CVC). In exchange, MWD would provide IRWD with an equal amount of water at a delivery point in its service area. IRWD and MWD would execute a wheeling agreement to facilitate the recovery and delivery of non-SWP water from the Strand Ranch Project and the Stockdale Integrated Banking Project to IRWD's service area. Such deliveries would occur through the wheeling service provisions of MWD's Administration Code.

2.6.5 Energy Consumption

The majority of project operational activity would be passive, gravity driven movement of water through pipes and basins. For example, the delivery of water via the CVC to Stockdale West would be gravity driven, such that no additional energy consumption for pumping would be required. However, the Central Intake Pipeline includes a pump station to lift water a few feet for conveyance from the CVC to Stockdale East. Recharge capacities for the Stockdale Properties are estimated to be approximately 27,100 AFY for Stockdale West and 19,000 AFY for Stockdale East. To achieve this amount of recharge, under conditions where source waters could not be conveyed via gravity, booster pumps operating at approximately 30 kwh/AF would result in approximately 813,000 kilowatt hours per year (kwh/year) at Stockdale West and 570,000 kwh/year at Stockdale East. This energy requirement would be as-needed and thus intermittent, rather than permanent and sustained.

In addition, the Central Intake pump station would lift up to 10,000 AFY of water from the CVC to Goose Lake Slough and other recharge facilities within Rosedale's Conjunctive Use Program. Rosedale expects this operational scenario may occur every three out of ten years. The pumps would operate at approximately 60 kwh/AF to lift water the distance between the CVC and Goose Lake Slough, resulting in approximately 600,000 kwh/year, when operating at full capacity.

Recovery wells also would be powered by the existing electrical grid. Recovery wells typically would operate between 300 and 550 kwh/AF. Based on this, to achieve recovery of approximately 11,250 AFY at Stockdale West and 7,500 AFY at Stockdale East, up to approximately 6,187,500 kwh/year would be required at Stockdale West and 4,125,000 kwh/year at Stockdale East. Recharge and recovery operations are not expected to occur simultaneously, and during some periods neither recharge nor recovery would be occurring.

2.6.6 Operating Plans

As described in Chapter 1, Section 1.5.2, the proposed project would be operated in accordance with the two Memoranda of Understanding Regarding Operation and Monitoring of the Rosedale-Rio Bravo Water Storage District Groundwater Banking Project (MOUs), Rosedale's Long Term

Operations Plan and Rosedale's and KWBA's Interim Operations Plan. These are described in Chapter 1 and provided in Appendix B.

2.7 Maintenance

The recharge and recovery facilities would require maintenance similar to the existing basins in Rosedale's Conjunctive Use Program. Rosedale would be responsible for the maintenance of all proposed facilities for the duration of the proposed project. Weed and pest control operations would be conducted as necessary, utilizing products approved for aquatic use in order to protect and preserve groundwater quality. Periodic earthwork operations would be required to maintain levees, enhance soil permeability, and remove vegetative growth. Earthwork would involve disking or scraping the basins to remove the top layer (e.g., one inch) of sediment, approximately once every three years. Earthwork equipment could include graders, loaders, and tractors (110-HP light motor). Maintenance would redistribute soils on-site and would not require off-site soil removal or disposal.

Agricultural land uses, such as annual farming, grazing, or fallowing, would be allowed within the basins at all three Stockdale property sites when the properties are not needed for water recharge or water management purposes. Grazing could be used to remove or control vegetative growth. The transport, use, and disposal of fertilizers and pesticides associated with agricultural activities at the Stockdale Properties would be done in accordance with applicable regulatory requirements, including the California Department of Pesticide Regulation's restrictions on pesticide use within artificial recharge basins and around wellheads. All agricultural users of the property would be prohibited from using chemicals that have been designated or suspected of having the potential to pollute groundwater, as determined by the manufacturer of the chemicals, California Department of Pesticide Regulation, California Environmental Protection Agency, the United States Environmental Protection Agency, or any other legal entity having jurisdiction over such matters. Use of pesticides and other chemicals in accordance with such regulatory restrictions would protect groundwater quality.

2.8 Project Approvals

As Lead Agency, Rosedale may use this EIR to approve the proposed project, make Findings regarding identified impacts, and if necessary, adopt a Statement of Overriding Considerations regarding these impacts. The Rosedale Board of Directors has the authority to certify this EIR. This EIR evaluates the proposed project at the project level for facilities at Stockdale East and Stockdale West, including the Central Intake Pipeline and its associated pump station and turnout, and the Stockdale West Turnout. The third Stockdale Property is evaluated at a program level. The components of the proposed project evaluated at the project level would proceed upon certification of this EIR by the Rosedale Board of Directors, adoption of this EIR by IRWD's Board of Directors, and approval of the project by both agencies. Depending on identification of the third Stockdale project site, additional environmental analysis may be required before approved components of that site can proceed.

In addition, as a Responsible Agency, IRWD would have discretionary approval over the construction of facilities and operation of the project under the terms of a proposed cooperative agreement to be developed as stipulated in the banking project terms between Rosedale and IRWD. IRWD would also consider the EIR prior to approving discretionary actions associated with implementing the project.

Other approvals required may include the following:

- Appropriative Water Rights Holders: Use or transfer of pre-1914 or post-1914 appropriative water rights
- State Water Resources Control Boards: Use or transfer of post-1914 appropriative water rights
- Regional Water Quality Control Board: Storm Water Pollution Prevention Plans (SWPPP)
- Department of Water Resources: approval for use of the California Aqueduct to convey water
- Kern County Water Agency (on behalf of the CVC participants): approval for use and modifications required to the Cross Valley Canal; encroachment permit
- Kern Water Bank Authority: Approval for use and modification of the Pioneer Canal
- MWD: approval to deliver, exchange, and convey water
- Kern County Roads Department: Easements for pipeline crossings
- Central Intake Easements: Temporary and permanent easements for pipeline

References – Project Description

California Department of Water Resources (DWR), 2009. *California Water Plan Update 2009*. December 2009.

Irvine Ranch Water District (IRWD), 2010. *2010 Urban Water Management Plan*. June 2011.

IRWD, 2013. *Irvine Ranch Water District Policy Position, Water Banking Transfers and Wheeling*. Revised August 2, 2013.

Metropolitan Water District of Southern California (MWD), 2010. *Regional Urban Water Management Plan*. Prepared by MWD. November 2010.

Ram Environmental, 2009. *Phase 1 Environmental Site Assessment (ESA-1).* Prepared for Rosedale-Rio Bravo Water Storage District. December 2009.

Rosedale-Rio Bravo Water Storage District (Rosedale), 2001. *Final Master Environmental Impact Report for the Groundwater Storage, Banking, Exchange, Extraction & Conjunctive Use Program*. Prepared by Boyle Engineering Corporation, July 2001.

Rosedale, 2003. *Addendum No. 1 to Master Final Environmental Impact Report for the Groundwater Storage, Banking, Exchange, Extraction & Conjunctive Use Program*, May 2003

Rosedale, 2009. *Addendum No. 2 to Master Final Environmental Impact Report for the Groundwater Storage, Banking, Exchange, Extraction & Conjunctive Use Program*, September 2009

Rosedale, 2011. *Addendum No. 3 to Master Final Environmental Impact Report for the Groundwater Storage, Banking, Exchange, Extraction & Conjunctive Use Program*.

Rosedale, 2008. *Final Environmental Impact Report, Strand Ranch Integrated Banking Project*, SCH No. 2007041080. Prepared by Environmental Science Associates, May 2008.

IRWD, 2010. Addendum No. 1 to *Strand Ranch Integrated Banking Project Final Environmental Impact Report*. October 2010.

Sierra Scientific Services, 2009. *A Determination of Aquifer Recharge and Storage Capacities for the Rosedale-Rio Bravo Water Storage District, Bakersfield, California*. Prepared for Rosedale-Rio Bravo Water Storage District, September 2009.

State Water Resources Control Board (SWRCB), 1999. *A Guide to Water Transfers*. Prepared by SWRCB Division of Water Rights, July 1999.

Thomas Harder & Co., 2014. *Draft Technical Memorandum – Stockdale Integrated Banking Project – Potential Impacts of Groundwater Level Changes on Abandoned Oil Wells.* Prepared for Rosedale-Rio Bravo Water Storage District. April 11, 2014.

Thomas Harder & Co., 2015. *Draft Proposed Stockdale Integrated Banking Project – Analysis of Potential Groundwater Level Changes from Recharge and Recovery at the Stockdale West and Stockdale East Facilities*. Prepared for Rosedale-Rio Bravo Water Storage District and Irvine Ranch Water District. January 23, 2015.

CHAPTER 3
Environmental Setting, Impacts, and Mitigation Measures

In compliance with *CEQA Guidelines* Sections 15125 and 15126, Chapter 3 of this Draft EIR provides an analysis of the environmental effects of the proposed project with respect to existing baseline conditions. Regional and local baseline conditions are considered to be the time the NOP was published, with the exception of the baseline used to evaluate impacts to groundwater. This groundwater baseline is described further in **Section 3.9 Hydrology and Water Quality**, which includes the analysis of project impacts to groundwater. The following environmental issue areas 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
- Mineral Resources
- Noise
- Transportation and Traffic
- Utilities and Energy

Environmental Issues not Addressed

The following environmental issues are not further analyzed in the Draft EIR as no impacts would occur as a result of project implementation.

Population and Housing

The proposed project involves the construction and operation of groundwater recharge basins on existing agricultural land. The proposed project would not displace existing housing or substantial numbers of people and would not require construction of replacement housing. The proposed project would not directly induce population growth by constructing new homes or businesses. Therefore, no impacts would occur. The potential for the proposed project to indirectly induce population growth is evaluated in Chapter 5, Growth Inducement.

Public Services

The proposed project would not affect service ratios, response times, or other performance objectives for fire protection, police protection, schools, parks, or other public facilities. As such, the proposed project would not require construction of new or altered government facilities in order to maintain acceptable performance objectives. No impacts would occur.

Recreation

The proposed project does not include recreational facilities and would not require construction or expansion of recreational facilities. In addition, the proposed project would not have direct local impacts to the growth or distribution of population in the project area. As such, the project would not increase the use of existing neighborhood and regional parks or other recreational facilities. There would be no physical deterioration of recreational facilities; no impacts would occur.

Format of the Environmental Analysis

The environmental analysis in Chapter 3 includes discussion of potential construction and operational impacts associated with the proposed facilities. Each environmental resource section includes the following subsections: Environmental Setting; Regulatory Framework; Impacts and Mitigation Measures; and References. The assessment of impacts for each resource area is provided at the project level for facilities and activities associated with Stockdale East and Stockdale West and the Central Intake Pipeline (*CEQA Guidelines* Section15161) and at the program level for facilities and activities associated with the third Stockdale project site (*CEQA Guidelines* Section15168). (Refer to Chapter 1, Section 1.2, Project-Level and Program-Level Analyses in this Draft EIR, for additional information.) Subsequent project-level environmental review will be conducted for impacts associated with the third Stockdale project site in accordance with CEQA prior to implementation of such project facilities, once the location has been identified. The analysis in this Draft EIR will provide the basis for any future project-level CEQA analysis for the third Stockdale site (*CEQA Guidelines* Section15168(c),(d)).

3.1 Aesthetics

Introduction

The purpose of this chapter is to analyze the potential impacts to aesthetics that could occur with project implementation. The analysis identifies visual character and scenic resources in the project area, including the existing landscape and built environment, and evaluates the potential for the project to affect such aesthetic features when viewed from public vantage points.

3.1.1 Environmental Setting

The proposed project consists of the Stockdale East property, the Stockdale West property, and a third Stockdale project site that would be located within a designated radius around both sites (collectively referred to as the "Stockdale Properties"). The third project site has yet to be identified; however it would likely be comprised of parcels that may or may not be contiguous up to 640 acres and be characterized by agricultural land use, similar to Stockdale East and Stockdale West as described below. The project also consists of the Central Intake Pipeline alignment, which would run within an easement along, between and through private agricultural property between Stockdale East and Goose Lake Slough. Regional views for the unincorporated area of Kern County are characterized by flat plains with low-density communities, water conveyance infrastructure, oil extraction facilities, and agricultural land. The nighttime lighting environment mainly consists of vehicle headlights and scattered street lighting from commercial, recreational, and residential development.

Project Sites

The Stockdale Properties are located in a rural area of western Kern County. Surrounding land uses primarily consist of agriculture, road-side commercial zones, and low-density rural residential communities. The Stockdale East property consists of approximately 230 acres used for agricultural production and petroleum extraction. Currently the crop grown on Stockdale East is alfalfa. Additionally, there is a pilot groundwater banking facility on Stockdale East. The Stockdale West property consists of approximately 323 acres that was formerly used for agricultural operation. The site has recently been developed with four recharge basins as part of a one-year Pilot Recharge Project to determine the functionality of recharge systems at that location. The recharge basins cover approximately 265 acres, and facilities consist of basins and earthen berms of varying shape, size, and depth. Immediately adjacent land uses include agriculture, groundwater recharge basins, and a pump station. **Figure 3.1-1** provides views of the project sites. Both Stockdale East and Stockdale West properties border the Pioneer Canal and the CVC to the south. The third Stockdale project site would be located within the radius depicted on Figure 2-1, which is characterized primarily by agricultural land and rural residential lands. The Central Intake Pipeline alignment would run primarily within dirt roads along, between and through agricultural fields, primarily orchards, and across the eastern edge of Stockdale East (Figure 2-4). The project sites are generally flat, as is the surrounding area.

View of alfalfa fields on the Stockdale East property

Pioneer Canal running along the southern boundary of the Stockdale East property

View of existing Stockdale West recharge basin

SOURCE: ESA, 2013

Stockdale Integrated Banking Project . 211181

Figure 3.1.1
Site Photos

Current views from the project sites are expansive areas of agricultural production. The project sites are adjacent to land that is characterized by irrigated agricultural fields in active cultivation and recharge basins. In addition, there is a cluster of residences and a pet boarding facility on Stockdale Highway, just east of Enos Lane and north of Stockdale East.

Views in all directions are dominated by flat expanses of agricultural land and oil recovery structures. Looking southwest, distant views of the Elk Hills are visible from the project site on clear days.

None of the roadways abutting the project site are considered scenic. Eligible State Scenic Highways within Kern County include State Route 58 between Mojave and Boron (70 miles from the project site), State Route 41 (55 miles), SR-14, and State Highway 395 beginning north of Mojave and continuing to the Inyo County Line (65.84 miles), none of which are in the vicinity of the project site. The Kern County General Plan does not identify any scenic resources in the project vicinity.

3.1.2 Regulatory Setting

Federal

National Scenic Byways Program

The National Scenic Byways program is part of the U.S. Department of Transportation, Federal Highway Administration. The program was established under the Intermodal Surface Transportation Efficiency Act of 1991, and was reauthorized in 1998 under the Transportation Equity Act for the 21st Century. Under the program, the U.S. Secretary of Transportation recognizes certain roads as National Scenic Byways or All-American Roads based on their archaeological, cultural, historic, natural, recreational, and scenic qualities.

State

California Scenic Highway Program

The California Department of Transportation (Caltrans) manages the California Scenic Highway Program, which was created in 1963 by the California legislature to preserve and protect scenic highway corridors from changes that would diminish the aesthetic value of lands adjacent to highways. The program includes a list of highways that are eligible for designation as scenic highways or that have been designated as such. A highway may be designated as scenic based on certain criteria, including how much of the natural landscape can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes on the traveler's enjoyment of the view. State laws governing the Scenic Highway Program are found in the Streets and Highways Code, Sections 260 through 263.

There are no designated state scenic highways within Kern County. However, the California Scenic Highway Mapping System (Caltrans, 2011) identifies three highway segments which are potentially eligible for future designation as scenic highways:

- SR 41, in the far northwest corner of the County;
- SR 58, from SR 14 east; and
- SR 14/US 395, from SR 58 north.

Local

Kern County General Plan (June 2004)

The Kern County General Plan discusses specific goals and policies related to aesthetics and visual quality for areas within the Kern County area or its Sphere of Influence. The Kern County General Plan also has a Scenic Route Corridors Element that has been adopted. This General Plan Element does not identify the project site as a significant scenic resource. The following General Plan policies for visual resources and aesthetics are relevant to the proposed project:

1.10.7 Light and Glare

Policy 47: Ensure that light and glare from discretionary new development projects are minimized in rural as well as urban areas.

Policy 48: Encourage the use of low-glare lighting to minimize nighttime glare effects on neighboring properties.

Chapter 19.81, Dark Skies Ordinance (Outdoor Lighting)

In November 2011, Kern County approved a Dark Skies Ordinance. The purpose of this ordinance is to maintain the existing character of Kern County by requiring a minimal approach to outdoor lighting, recognizing that excessive illumination can create a glow that may obscure the night sky and excessive illumination or glare may constitute a nuisance. The ordinance provides requirements for outdoor lighting within specified unincorporated areas of Kern County in order to accomplish the following objectives:

- Objective 1: Encourage a safe, secure, and less light-oriented night-time environment for residents, businesses and visitors.
- Objective 2: Promote a reduction in unnecessary light intensity and glare, and to reduce light spillover onto adjacent properties.
- Objective 3: Protect the ability to view the night sky by restricting unnecessary upward projections of light.
- Objective 4: Promote a reduction in the generation of greenhouse gases by reducing wasted electricity that can result from excessive or unwanted outdoor lighting.

Metropolitan Bakersfield General Plan (December 2002)

A portion of the project sites are located within the planning area of the Metropolitan Bakersfield General Plan. This General Plan discusses specific goals or policies related to aesthetics and visual quality for areas within the Metropolitan Bakersfield area or its Sphere of Influence. The General Plan also contains a specific section that discusses the existing scenic resources located in the area. The following General Plan policies for visual resources and aesthetics are relevant to the proposed project:

Policy 1: Promote the establishment, maintenance, and protection of the planning area's open space resources, including the following:

(a) Conservation of natural resources

- Kern River Corridor
- Management of hillsides

(b) Managed production of resources

- Agriculture
- Oil production

(c) Outdoor Recreation

- Parks
- Kern River Corridor

Policy 7: Consider the use of groundwater recharge lands for recreation, habitat, and alternate resource uses.

Metropolitan Bakersfield Draft General Plan Update: Existing Conditions, Constraints, and Opportunities Report (April 2009)

In April 2009 the City of Bakersfield published an Existing Conditions, Constraints, and Opportunities Report to highlight issues, challenges, and recommended changes to the existing General Plan. Related to the proposed project, the report recommends definition of "scenic resources" and the identification of existing or potential scenic resources in the Metropolitan Bakersfield area on a map. In addition, the report suggests preservation of groundwater banking and recharge areas to reduce overdraft, including providing buffer areas around water banks.

Metropolitan Bakersfield General Plan Update EIR (June 2002)

The Metropolitan Bakersfield General Plan Update EIR discusses specific issues related to aesthetics and visual quality for areas within the Metropolitan Bakersfield area or its Sphere of Influence. The General Plan EIR also contains a specific section that discusses the existing scenic resources located in the area. None of the specific scenic resources are located in the vicinity of the project area. The General Plan EIR mentions that generally the Kern River Corridor is a scenic resource within the Metropolitan Bakersfield area.

3.1.3 Impact Assessment

Thresholds of Significance

The following criteria from Appendix G of the *CEQA Guidelines* are used as thresholds of significance to determine the impacts of the proposed project as related to aesthetic resources. The proposed project would have a significant impact if it would:

1. Have a substantial adverse effect on a scenic vista.
2. Substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.
3. Substantially degrade the existing visual character or quality of the site and its surroundings.

4. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

The impact determination is based on several evaluation criteria, including the extent of project visibility from sensitive viewing areas such as designated state routes and public open space or vantage points; the degree to which the various project elements would contrast with or be integrated into the existing landscape; the extent of change in the landscape's composition and character; and the number and sensitivity of viewers.

Effects Found Not to be Significant

Threshold 1: Scenic Vista

Neither the Stockdale Properties nor the Central Intake Pipeline would be located within a designated scenic vista or scenic highway corridor. No impacts to scenic vistas would occur as a result of the proposed project.

Threshold 2. Scenic Resources

Scenic corridors consist of land that is visible from the highway right of way and are comprised primarily of scenic and natural features. Topography, vegetation, viewing distance, and/or jurisdictional lines determine the corridor boundaries. There are no designated scenic highways in the project vicinity; therefore the proposed project would not affect any scenic resources within a scenic highway corridor. There would be no impact.

Impacts and Mitigation Measures

Threshold 3. Visual Character

Impact AES-1: The proposed project could alter the existing visual character of the sites by changing the land use from agricultural production to a combination of groundwater recharge, water conveyance, and agricultural production.

The proposed project would occur in an area dominated by agricultural land uses. Groundwater recharge projects, similar to the proposed project, have been implemented on neighboring properties, both in between and south of Stockdale East and Stockdale West and within the radius proposed for the third Stockdale project site. Figure 2-2 identifies preliminary locations of the extraction wells on the Stockdale West and Stockdale East properties.

Stockdale West

The Stockdale West property was formerly used for agricultural operation, but has recently been developed with recharge basins as part of a Pilot Recharge Project to determine the functionality of recharge systems at that location. Four recharge basins have been constructed that total approximately 265 acres (or 82 percent) of approximately 323 acres, including basins and earthen berms consisting of varying shape, size, and depth. The layout of the existing basins is shown in Figure 2-2. The basins were constructed to avoid the edges of the Pioneer Canal and the CVC. Dirt roads run along the perimeter of and in between all basins to provide access to facilities during operation and maintenance activities. Dirt road levee tops are approximately 20 feet wide. The proposed project would utilize the existing recharge basins, and no other onsite recharge basins would be constructed at the Stockdale West property. Three recovery wells would be

constructed at a minimum of 880-foot setback from the southern property lines, which form a boundary with Kern Water Bank Authority. Wellheads would consist of riser pipes, discharge pipes, wellhead motors, submersible pumps, and other appurtenances, and would be protected by lockable, roofed, metal-mesh pump houses that are approximately four feet in height and constructed on 12-foot square concrete pads. The Stockdale West Turnout would involve a new CVC turnout within the CVC right-of-way and an underground pipeline between the turnout and Stockdale West. Therefore, the majority of the facilities required to operate the banking facilities on Stockdale West are already constructed or would be underground, with the exception of the extraction wells and associated appurtenances, which are minimal in nature and would not alter the overall visual character of the site.

Stockdale East

The Stockdale East property is currently used for agricultural purposes and includes an active oilfield. Stockdale East would be developed with recharge facilities, including basins and berms, occupying approximately 200 acres (or 87 percent) of the 230-acre property. Recharge facilities would consist of approximately eight recharge basins of varying shape, size, and depth. Approximately two recovery wells may also be constructed. Basins would be formed by excavating and contouring existing soils and using excavated soils to form earthen berm walls. Basin depths would average approximately three feet, and basin berms would be three to five feet, extending up to six feet above ground level. Existing oil facilities associated with the oilfield activities would remain onsite and maintained for access to underlying mineral rights. The basins would be constructed to avoid the CVC. The berms would be managed to blend into the surrounding landscape and to allow agricultural land uses to continue, such as farming or grazing.

At the Stockdale East property, the proposed project would modify the character of the property by converting the agricultural fields to recharge basins and recovery facilities. Views from Stockdale Highway and the cluster of residences north of Stockdale East would change from the existing flat fields to contoured berms and basins. Existing oil facilities would remain onsite. The recharge basins constructed would be consistent with similar recharge facilities adjacent to the project site at Strand Ranch, which would make the character similar to surrounding land uses. Furthermore, after construction is complete, recharge basins would be used for agricultural purposes, such as farming, grazing, or fallowing, which also is similar to the existing land use at the property.

Third Stockdale Project Site

The third Stockdale project site has yet to be identified; however it would likely be comprised of parcels that may or may not be contiguous up to 640 acres and be characterized by agricultural land use. Recharge basins, recovery wells, access roads, and associated facilities would be constructed for the third Stockdale property. Similar modifications to immediate views of the property would result from project construction as described for Stockdale East and Stockdale West. The third Stockdale project site would be located within the site radius identified on Figure 2-1, which includes existing agricultural lands, recharge basins, and recovery and conveyance facilities. As such, although agricultural land would be converted to groundwater banking facilities, the nature of the site would be consistent with overall visual character of surrounding properties within the site radius. Agricultural land uses, such as annual farming, grazing, or

fallowing, would be allowed within recharge basins at the third Stockdale property when not needed for water recharge or water management purposes.

Conveyance Facilities

The Central Intake Pipeline would be constructed within Stockdale East and within an easement through private agricultural property between Stockdale East and Goose Lake Slough (Figure 2-4). The underground pipeline would be up to 72 inches in diameter, and the right-of-way would vary between 30 and 60 feet. The pipeline would be installed primarily within existing dirt roads that separate orchard plots. As such, although several trees from adjacent agricultural fields would be removed to ensure space for the pipeline right-of-way, this project component would be underground once constructed and consistent with the overall visual character of the project area. The associated Central Intake pump station and CVC turnout would be on Stockdale East, set back and minimally visible from Stockdale Highway. Similarly, the Stockdale West Turnout would be set back and minimally visible from Stockdale Highway. The pipeline connecting the Stockdale West Turnout to the Stockdale West recharge basins would be belowground and would not affect visual character of the Stockdale West site once constructed.

Impact Determination

The visual character of the Stockdale Properties and the Central Intake Pipeline alignment and their surroundings would not be substantially degraded by implementing recharge and recovery facilities onsite. Neighboring and surrounding properties include a mixture of agricultural, rural residential, and groundwater banking land uses and facilities. Conversion of the Stockdale Properties from agricultural production to include groundwater banking and water conveyance would not change the composition and character of the surrounding landscape. Impacts to visual character would be less than significant.

Significance Conclusion

Less than Significant.

Mitigation Measures

None required.

Threshold 4: Light or Glare

Impact AES-4: The proposed project would create new sources of nighttime lighting.

The proposed project would require temporary nighttime construction, in particular 24-hour drilling for well construction. Three wells would be constructed on Stockdale West and two wells on Stockdale East. Once the third Stockdale project site is identified, the number of wells would be identified. The project sites are predominately surrounded by agricultural fields with sparse residential uses, such as the cluster or residences north of Stockdale East on Stockdale Highway. Nighttime construction would require security lighting in addition to construction lighting. In accordance with **Mitigation Measure AES-1**, all nighttime lighting would be shielded and directed downwards onto the construction work area and spillover into the surrounding properties

is not anticipated. Construction lighting would be temporary and short-term and would not create a new permanent source of nighttime light or glare.

Security lighting may be installed on new wellhead facilities; however such lighting would be attached to motion sensors and, in accordance with Mitigation Measures AES-1, would be directed downward to focus lighting to the immediate surroundings and avoid light spillover onto surrounding areas.

Impact Determination

Nighttime construction lighting and security lighting would be shielded and directed downward, away from neighboring properties and surrounding areas, in accordance with Mitigation Measures AES-1. Construction lighting would be temporary and permanent security lighting would be connected to motion sensors. As a result, the proposed project would minimize new nighttime light sources and would protect the ability to view the night sky by restricting unnecessary upward projection of light, in support of the Kern County Dark Skies Ordinance. Impacts related to light and glare would be less than significant with mitigation.

Significance Conclusion

Less than Significant with Mitigation.

Mitigation Measures

AES-1: All nighttime construction lighting and security lighting installed on new facilities shall be shielded and directed downward to avoid light spill onto neighboring properties.

3.2 Agriculture and Forestry Resources

This chapter describes the environmental setting for agricultural and forestry resources, summarizes the applicable regulatory framework, and identifies impacts to agricultural resources that could occur as a result of implementation of the proposed project.

3.2.1 Environmental Setting

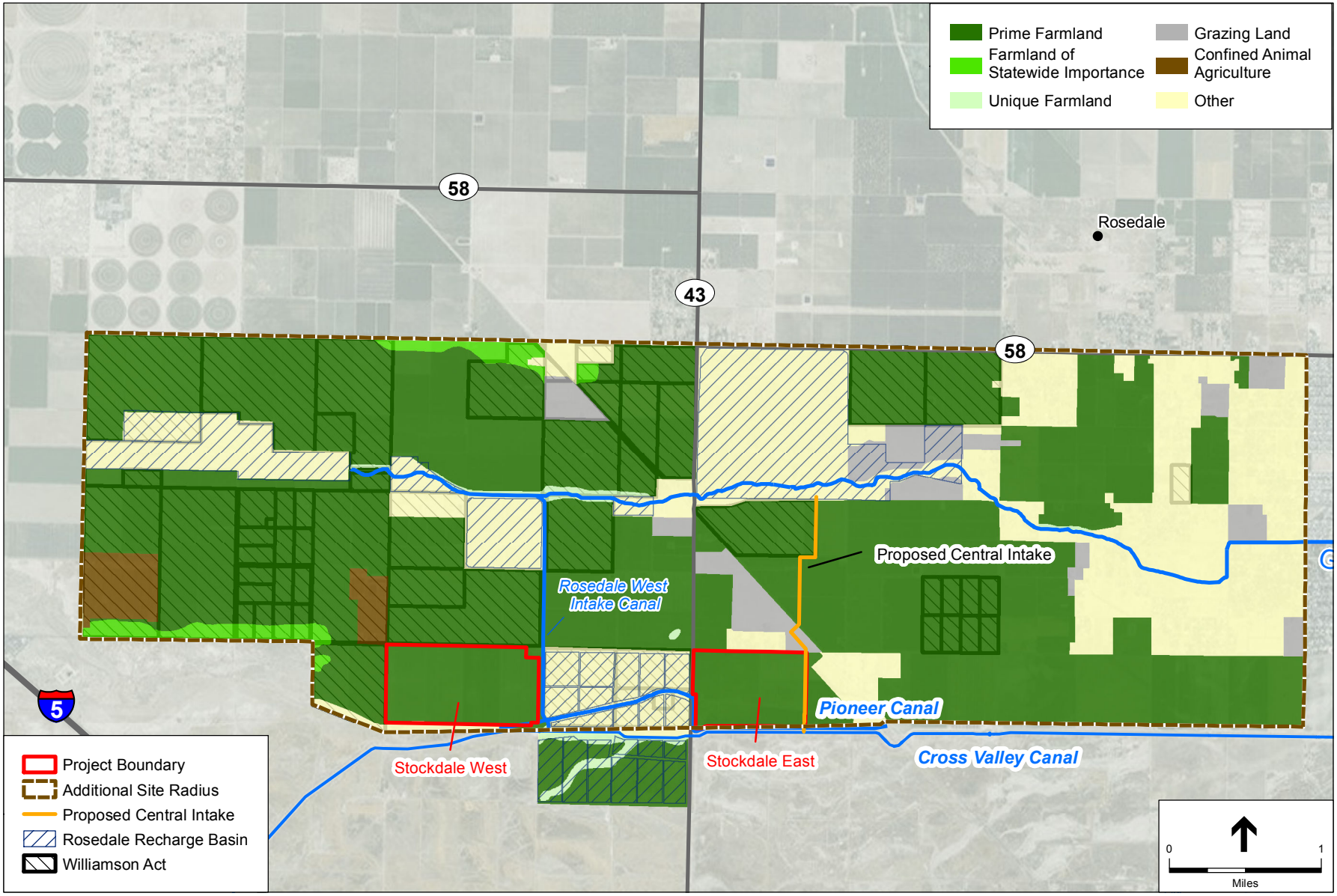
Regional

The project is located in the southern San Joaquin Valley in Kern County near the cities of Bakersfield, Wasco, McFarland, and Shafter. The San Joaquin Valley, along with the Sacramento Valley to the north, makes up the greater California Central Valley, which is a large, flat valley that dominates the central portion of the state. The San Joaquin Valley is bounded by the Sierra Nevada to the east, the Tehachapi Mountains to the south, the Coast Range to the west, and the Sacramento Valley to the north.

California is the nation's top agricultural producer, and Kern County is the fourth most productive county in the state after Fresno, Tulare, and Monterey Counties (CDFA, 2012). Kern County leads the state in grape, citrus, and milk production and other notable agricultural commodities such as almonds, cotton, and cottonseed (CDFA, 2012). Other important agricultural commodities for Kern County include carrots, pistachios, hay/alfalfa, potatoes, cattle, tomatoes, roses, bell peppers, silage/forage, wheat, fruit/nuts, turf, eggs, apples, and cherries (Kern County, 2012a).

Local

The proposed project consists of the Stockdale East property, the Stockdale West property, and a third Stockdale project site that would be located within a designated radius around both sites (collectively referred to as the "Stockdale Properties"). The project also consists of the Central Intake alignment, which would run within an easement along, between and through private agricultural property between Stockdale East and Goose Lake Slough, The Stockdale Properties and the Central Intake alignment are located in unincorporated Kern County. The Stockdale East property and the Stockdale West property are contiguous with and just south of Rosedale's service area boundary. According to Zoning Map 121 of Kern County, both Stockdale East and Stockdale West parcels are zoned as Exclusive Agriculture (A), and the Central Intake alignment is zoned as Exclusive Agriculture and Intensive Agriculture. Land uses surrounding Stockdale East and Stockdale West generally are limited to agricultural lands and rural residences on properties sized one acre or greater (see **Chapter 3.10 Land Use, Planning and Recreation** for more information).



SOURCE: ESRI 2013, California Department of Conservation 2010, Williamson Act 2009

Stockdale Integrated Banking Project . 211181

Figure 3.2-1

Designated Farmland in the Project Vicinity

The state Farmland Mapping and Monitoring Program maps and ranks important farmland in California. The Stockdale East and Stockdale West parcels are characterized entirely as Prime Farmland (California Department of Conservation, 2012) as shown in **Figure 3.2-1**. The Central Intake alignment is characterized by both Prime Farmland and Grazing Land (California Department of Conservation, 2012). See Subsection 3.2.2 below for definitions of these farmland types. The parcels within a two-mile radius of the proposed project site include lands classified as Prime Farmland, Unique Farmland, Farmland of Statewide Importance, Grazing Land., Vacant or Disturbed Land, and Nonagricultural and Natural Vegetation. These lands include the potential location of the third Stockdale project site as shown in Figure 3.2-1.

Kern County uses an Agricultural Preserve Program to designate all land in the agricultural spectrum within the county. The Agricultural Preserve Program intends to preserve agriculture land necessary to the State's economic vitality, and is enforced through provisions in the Williamson Act. The Stockdale East property and the Central Intake alignment are located in Agricultural Preserve 10 while the Stockdale West parcel is located in Agricultural Preserve 9 (Kern County, 2012b). Stockdale East and Stockdale West are not subject to a Williamson Act contract. There are lands under Williamson Act contract adjacent to the northern portion of the Central Intake alignment south of Brimhall Road.

The third Stockdale project site has yet to be identified; however it would likely be up to one square mile (640 acres) and be characterized by agricultural land. Within the radius for the additional site, Agricultural Preserves 9 and 10 take up much of the area, while Agricultural Preserve 11 skirts the northeast of the radius boundary (Kern County, 2012b). Specific zoning, Farmland Mapping and Monitoring Program classifications, and Kern County Agricultural Preserve Program designations, would be determined within a subsequent CEQA analysis, once the location has been identified.

Restrictive Use Agreement

Approximately 165 acres of Stockdale East is subject to a Restrictive Covenant and Equitable Servitude Agreement for Agricultural Land Preservation (Agreement). This Agreement is between SunEdison and Rosedale as part of SunEdison's effort to mitigate the loss of farmland classified as Prime Farmland, Farmland of Statewide Importance, or Unique Farmland due to implementation of its Adobe Solar project. To fulfill its mitigation requirement, SunEdison has entered into the Agreement with Rosedale to protect the agricultural value of these 165 acres. The Agreement serves Conservation Purposes in order to retain the productive agricultural use and character of the property, and to prevent the development of land uses that would interfere with the property's agricultural productive capacity and value (RRBWSD, 2013).

The Agreement ensures that Rosedale will retain the right to use the property for agricultural purposes (or permit others to use the property for such purposes), in a manner that ensures the agricultural qualities of the land are not impaired. The Agreement requires that Rosedale (or its lessees) use the land for commercial agricultural purposes for seven months out of each twelve month period, subject to Rosedale's right to use the property for water management and water recharge purposes. The Agreement prohibits construction, erection, installation, or placement of buildings, structures, or other improvements on the land unless for agricultural purposes. The

Agreement allows water recharge ponds, drilling water wells, existing water wells, pumps, electrical service, and irrigation water distribution ditches, pipelines and other systems, and any other facilities for the production, generation, storage or transmission of water or related to the exercise of rights reserved by Rosedale.

3.2.2 Regulatory Setting

State

California Department of Conservation, Division of Land Resource Protection

The DOC applies the soil classifications created by the Natural Resources Conservation Service (NRCS) to identify and plan for California's agricultural land resources. The DOC has a minimum mapping unit of 10 acres, with parcels that are smaller than 10 acres being absorbed into the surrounding classifications.

The list below describes the categories mapped by the DOC. Collectively, lands classified as Prime Farmland, Farmland of Statewide Importance, and Unique Farmland are referred to as Farmland (DOC, 2004).

- **Prime Farmland.** Farmland that has the best combination of physical and chemical features able to sustain long-term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.
- **Farmland of Statewide Importance.** Farmland similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.
- **Unique Farmland.** Farmland of lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated, but may include non-irrigated orchards or vineyards as found in some climatic zones in California. Land must have been used for crops at some time during the four years prior to the mapping date.
- **Farmland of Local Importance.** Land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee.
- **Grazing Land.** Land on which the existing vegetation is suited to the grazing of livestock. This category was developed in cooperation with the California Cattlemen's Association, University of California Cooperative Extension, and other groups interested in the extent of grazing activities. The minimum mapping unit for Grazing Land is 40 acres.
- **Urban and Built-up Land.** Land occupied by structures with a building density of at least one unit to 1.5 acres, or approximately six structures to a 10-acre parcel. This land is used for residential, industrial, commercial, institutional, public administrative purposes,

railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.

- **Other Land.** Land not included in any other mapping category. Common examples include low-density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry, or aquaculture facilities; strip mines and borrow pits; and water bodies smaller than 40 acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land.

Land Evaluation and Site Assessment Model (LESA)

The Land Evaluation and Site Assessment (LESA) is a point-based approach for rating the relative importance of agricultural land resources based upon specific measurable features.

The California LESA Model was developed to provide lead agencies with an optional methodology to ensure that potentially significant effects on the environment of agricultural land conversions are quantitatively and consistently considered in the environmental review process (Public Resources Code Section 21095), including in California Environmental Quality Act (CEQA) reviews.

The California Agricultural LESA Model evaluates measures of soil resource quality, a given project's size, water resource availability, surrounding agricultural lands, and surrounding protected resource lands. For a given project, the factors are rated, weighted, and combined, resulting in a single numeric score. The project score becomes the basis for making a determination of a project's potential significance.

Williamson Act

The California Land Conservation Act of 1965, also known as the Williamson Act, is designed to preserve agricultural and open space lands by discouraging their premature and unnecessary conversion to urban uses. Williamson Act contracts, also known as agricultural preserves, create an arrangement whereby private landowners contract with counties and cities to voluntarily restrict their land to agricultural and compatible open-space uses. The vehicle for these agreements is a rolling term 10-year contract.[1] In return, restricted parcels are assessed for tax purposes at a rate consistent with their actual use, rather than potential market value. To cancel a Williamson Act contract, either the local government or the landowner can initiate the nonrenewal process. A "notice of nonrenewal" starts a 9-year nonrenewal period. During the nonrenewal process, the annual tax assessment gradually increases. At the end of the 9-year nonrenewal period, the contract is terminated. Contracts renew automatically every year unless the nonrenewal process is initiated. Williamson Act contracts can be divided into the following categories: Prime Agricultural Land, Non-Prime Agricultural Land, Open Space Easement, Built Up Land, and Agricultural Land in Non-Renewal.

[1] Information about the basic provisions of Williamson Act contracts can be found on the California Department of Conservation, Division of Land Resource Protection web site: http://www.consrv.ca.gov/DLRP/lca/basic_contract_provisions/Pages/index.aspx, accessed October 17, 2012.

The Williamson Act states that a board or council by resolution shall adopt rules governing the administration of agricultural preserves. The rules of each agricultural preserve specify the uses allowed. Generally, any commercial agricultural use will be permitted within any agricultural preserve. In addition, local governments may identify compatible uses permitted with a use permit. As described below, the Kern County Planning Department has adopted its own rules governing agricultural preserves and compatible uses.

Farmland Security Zone Act

The Farmland Security Zone Act is similar to the Williamson Act and was passed by the California State Legislature in 1999 to ensure that long-term farmland preservation is part of public policy. Farmland Security Zone Act contracts are sometimes referred to as "Super Williamson Act Contracts." Under the provisions of this act, a landowner already under a Williamson Act contract can apply for Farmland Security Zone status by entering into a contract with the county. Farmland Security Zone classification automatically renews each year for an additional 20 years. In return for a further 35 percent reduction in the taxable value of land and growing improvements (in addition to Williamson Act tax benefits), the owner of the property promises not to develop the property into nonagricultural uses.

Public Resources Code Section 21060.1

Public Resources Code (PRC) Section 21060.1 defines agricultural land for the purposes of assessing environmental impacts using the Farmland Mapping and Monitoring Program (FMMP). The FMMP was established in 1982 to assess the location, quality, and quantity of agricultural lands and the conversion of these lands. The FMMP provides guidance for the analysis of agricultural and land use changes throughout California.

Local

Kern County Agricultural Preserve Standard Uniform Rules

The Kern County Planning Department has adopted *Agricultural Preserve Standard Uniform Rules*, which identify land uses that are compatible within agricultural preserves established under the Williamson Act (Kern County Planning Department, 2009). The rules are designed to restrict land uses to those compatible with agriculture, including crop cultivation, livestock breeding, grazing operations, and dairies. In addition, some non-agricultural land uses are considered compatible, including public utilities facilities (e.g., gas, electric, communication, water) and groundwater recharge facilities. Public water utility facilities are considered compatible uses when the following is proposed:

- The erection, construction, alteration, operation, and maintenance of gas, electric, water, and communication utility facilities and similar public service facilities by corporations and companies under the jurisdiction of the Public Utilities Commission of the State of California and by public agencies.

Water recharge facilities, as defined in Section 51201(b), Public Resources Code, are considered compatible uses when either:

- The affected land will continue to be used for commercial agricultural purposes for a minimum of seven (7) months out of each twelve (12) month period; or,

- The Land Use Contract is amended by the Board of Supervisors to allow water recharge as the primary purpose of an "open space" contract, as provided for in Section 51201, Public Resources Code. (included by Kern County Board of Supervisors Resolution 2007-017)

Kern County General Plan

The *Kern County General Plan* (County General Plan) states that agriculture is vital to the future of Kern County and sets the goals, policies, and procedures of protecting important agricultural lands for future use and to prevent conversion of prime farmland to other uses (Kern County Planning Department, 2009). Currently Stockdale East and West parcels are designated as Intensive Agriculture (Map Code 8.1) by the County General Plan (Kern County Planning Department, 2009). According to the County General Plan, permitted uses under this designation include water storage and groundwater recharge acres and facilities (Kern County Planning Department, 2009). Therefore, the proposed project is compatible with the County General Plan. Within the Land Use, Open Space, and Conservation Element Resource Section of the County General Plan, there are goals, policies, and implementation measures that are applicable to the proposed project regarding agricultural resources:

Goal 1: To contain new development within an area large enough to meet generous projections of foreseeable need, but in locations which will not impair the economic strength derived from the petroleum, agriculture, rangeland, or mineral resources, or diminish the other amenities which exist in the County.

Goal 2: Protect areas of important mineral, petroleum, and agricultural resource potential for future use.

Goal 5: Conserve prime agriculture lands from premature conversion.

Policy 7: Areas designated for agricultural use, which include Class I and II and other enhanced agricultural soils with surface delivery water systems, should be protected from incompatible residential, commercial, and industrial subdivision and development activities.

Policy 10: To encourage effective groundwater resource management for the long-term economic benefit of the County the following shall be considered:

- Promote groundwater recharge activities in various zone districts.
- Support the development of future sources of additional surface water and groundwater, including conjunctive use, recycled water, conservation, additional storage of surface water and groundwater and desalination.

Implementation Measure F: Prime agricultural lands, according to the Kern County Interim-Important Farmland 2000 map produced by the Department of Conservation, which have Class I or II soils and a surface delivery water system shall be conserved through the use of agricultural zoning with minimum parcel size provisions.

Metropolitan Bakersfield General Plan

The Stockdale East parcel and the eastern portion of the area designated for the third Stockdale project site are located within the area governed by the *Metropolitan Bakersfield General Plan*

(Bakersfield General Plan) (City of Bakersfield and Kern County, 2002). Within the Conservation Element Soils and Agriculture Section of the Bakersfield General Plan, there is a goal, policies, and an implementation measure that are applicable to the proposed project regarding agricultural resources:

Goal 1: Provide for the planned management, conservation, and wise utilization of agricultural land in the planning area.

Policy 3: Protect areas designated for agricultural use, which include Class I and II agricultural soils having surface delivery water systems, from the encroachment of residential and commercial subdivision development activities.

Policy 14: When considering proposals to convert designated agricultural lands to non-agricultural use, the decision-making body of the City or County shall evaluate the following factors to determine the appropriateness of the proposal:

- Soil Quality;
- Availability of irrigation water;
- Proximity to non-agricultural uses;
- Proximity of intensive parcelization;
- Effect on properties subject to "Williamson Act" land use contracts;
- Ability to be provided with urban services (sewer, water, roads, etc.);
- Ability to affect the application of agricultural chemicals on nearby agricultural properties;
- Ability to create a precedent-setting situation that leads to the premature conversion of prime agricultural lands;
- Demonstrated project need; and
- Necessity of buffers as lower densities, setbacks, etc.

Implementation Measure 2: Evaluate discretionary projects for their impact on agricultural resources.

3.2.3 Impact Assessment

Thresholds of Significance

The following criteria from Appendix G of the *CEQA Guidelines* are used as thresholds of significance to determine the impacts of the proposed project as related to agricultural resources. The proposed project would have a significant impact if it would:

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.

2. Conflict with existing zoning for agricultural use, or a Williamson Act contract.
3. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g)).
4. Result in the loss of forest land or conversion of forest land to non-forest use.
5. 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.

Effects Found Not to be Significant

Threshold 3. Conflict with Forest Land Zoning

The proposed project does not include lands zoned as forest land, timberland, or timberland zoned Timberland Production. There would be no conflict with forest land zoning. There would be no impact.

Threshold 4. Loss of Forest Land

The proposed project does not include forest land. Therefore, the proposed project would not result in the loss of forest land or conversion of forest land to non-forest use. There would be no impact.

Impacts and Mitigation Measures

Threshold 1. Convert Prime Farmland

Impact AGR-1: The proposed project would build groundwater banking and conveyance facilities on lands designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance.

Stockdale East and West Properties

As shown on **Figure 3.2-1**, Stockdale East and Stockdale West are designated as Prime Farmland by the FMMP (California Department of Conservation, 2012). On Stockdale West, recharge basins are already fully constructed; additional aboveground facilities to be installed include new wellheads for production wells and the outlet from the Stockdale West Turnout. On Stockdale East approximately 200 acres of existing agricultural fields would be affected by construction of aboveground facilities, including new recharge basins and earthen berms, wellheads, a portion of the Central Intake Pipeline and pump station, and the Central Intake Turnout.

Although Stockdale West would not be primarily used for active agricultural production, direct agricultural uses would not be precluded in the long-term future and would be implemented onsite in the short-term within the recharge basins. Agricultural land uses, such as annual farming, grazing, or fallowing, would be allowed within the basins at Stockdale West when not operated for water recharge or water management purposes. Groundwater recharge facilities are considered to be compatible agricultural land uses according to Kern County's *Agricultural*

Preserve Standard Uniform Rules, Kern County's General Plan Land Use designation of Intensive Agriculture, and Kern County's zoning designation for Exclusive Agriculture (see **Chapter 3.10 Land Use, Planning and Recreation** for more information).

Approximately 165 acres (72%) of Stockdale East is subject to a Restrictive Covenant Agreement that requires Rosedale to use the land for commercial agricultural purposes for seven months out of each twelve month period, subject to Rosedale's right to use the property for water management and water recharge purposes. Accordingly, the Restrictive Covenant Agreement allows for the construction of recharge ponds, wells, pumps, pipelines and any other facilities for the production, generation, storage or transmission of water. Therefore, implementation of the proposed project would maintain commercial agricultural uses at Stockdale east in accordance with the Restrictive Covenant Agreement. Agricultural land uses, such as annual farming, grazing, or fallowing, would be allowed within the basins at Stockdale East when not operated for water recharge or water management purposes.

Third Stockdale Project Site

The third Stockdale project site would be located within the radius identified on Figure 3.2-1 on land up to 640 acres. As shown on the figure, there is Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and other nonagricultural and built up lands within the proposed radius. Grazing could also occur at the site. Similar to activities described above, any existing structures may need to be demolished, and groundwater recharge and recovery facilities would be constructed onsite at the third Stockdale project site, which may include FMMP-designated farmland. Similar to Stockdale East and Stockdale West, groundwater recharge facilities built at the third Stockdale project site would be considered a compatible agricultural land use; would allow for agricultural uses while the basins are not used for recharge; and would not preclude future use of the parcel for direct agricultural production or grazing. Therefore, implementation of the proposed project is not expected not result in the conversion of FMMP-designated farmland to non-agricultural use.

Central Intake Pipeline

The Central Intake Pipeline would affect land between Stockdale East and the Goose Lake Slough that is designated as Prime Farmland by the FMMP (California Department of Conservation, 2012). Water conveyance facilities are considered to be compatible agricultural land uses according to Kern County's *Agricultural Preserve Standard Uniform Rules*, Kern County's General Plan Land Use designation of Intensive Agriculture, and Kern County's zoning designation for Exclusive Agriculture (see **Chapter 3.10 Land Use, Planning and Recreation** for more information). Construction of the Central Intake Pipeline would primarily occur within existing dirt roads between agricultural fields; however, almond trees along the edges of the orchard properties adjacent to the pipeline alignment would be removed. Approximately 6.8 acres would be removed from active agricultural production; however, the land would not be permanently converted to non-agricultural use, as the land could still be cultivated in the future.

A Land Evaluation and Site Assessment (LESA) was completed for the proposed disturbance associated with installation of the Central Intake Pipeline. The LESA assessed the agricultural viability of the land and soils to determine the potential impact of constructing the pipeline and

removal of the orchard trees. Utilizing the LESA Model, a final score of 55.125 (out of 100) was calculated (see **Appendix G**). According to the Model Scoring Thresholds of CEQA, the construction of the Central Intake Pipeline would be considered to have a less than significant impact on agricultural resources (See "Instruction Manual" in Appendix G for making significance determinations).

Impact Determination

The proposed project would support agricultural resources in the region through groundwater recharge and conveyance. The proposed project would be compatible with the goals and policies of the Kern County General Plan for protecting agricultural resources through the beneficial use of percolation basins and conveyance facilities and would reduce the potential for the Stockdale Properties and the Central Intake alignment to be converted to permanent non-agricultural land uses, such as residential, commercial, or industrial uses. The implementation of groundwater recharge, recovery, and conveyance facilities at the Stockdale Properties and the Central Intake alignment would not result in the conversion of Prime Farmland or other FMMP-designated farmland to non-agricultural uses. Agricultural land uses, such as annual farming, grazing, or fallowing, would be allowed within the basins at the Stockdale Properties when not operated for water recharge or water management purposes. The Stockdale Properties also would be managed in accordance with Kern County's rules for agricultural preserves as applicable. Rosedale and/or IRWD (or their respective lessees) shall supply any water necessary for irrigated agriculture or other overlying uses. Impacts would be less than significant.

Significance Conclusion

Less than Significant.

Mitigation Measures

None required.

Threshold 2. Conflict with Williamson Act Contract

Impact AGR-2: The proposed project could build groundwater banking facilities on lands under a Williamson Act contract.

Neither the Stockdale East property nor the Stockdale West property are contracted as agricultural preserves under the Williamson Act, as shown in Figure 3.2-1 (Kern County, 2012b). There are lands under Williamson Act contract adjacent to the northern portion of the Central Intake alignment south of Brimhall Road. In addition, the third Stockdale project site has the potential to be located on lands under Williamson Act contract, given the presence of such lands within the designated site radius (Figure 3.2-1). Therefore, the potential exists for the proposed project to conflict with existing zoning for agricultural use or a Williamson Act contract.

Impact Determination

If the third Stockdale project site were to be located within a County-designated agricultural preserve and/or under an existing Williamson Act contract, then Kern County's *Agricultural*

Preserve Standard Uniform Rules may apply. The *Standard Uniform Rules* state that groundwater recharge operations are compatible land uses on agricultural preserves if the preserve is used for commercial agriculture for at least seven months out of a twelve month period (Kern County Planning Department, 2009). Farming and livestock grazing are considered compatible agricultural uses. Alternatively, groundwater recharge facilities are considered compatible land uses if the Land Use Contract is amended by the County Board of Supervisors to allow water recharge as the primary purpose of an "open space" contract.

Implementation of **Mitigation Measure AGR-1** would require compliance with the *Standard Uniform Rules* as applicable to avoid conflict with agricultural zoning or potential Williamson Act contracts. If the third Stockdale project site is not under a Williamson Act contract, then Mitigation Measure AGR-1 would not apply. Impacts would be less than significant with mitigation.

Although the Central Intake Pipeline would run alongside an orchard under a Williamson Act contract, the pipeline would be underground and would not preclude the use of the property for commercial agriculture for seven months per every twelve month period, as required by the County's *Agricultural Preserve Standard Uniform Rules*. Impacts would be less than significant, and no mitigation is required.

Significance Conclusion

Less than Significant with Mitigation.

Mitigation Measures

AGR-1: If the third Stockdale project site is under a Williamson Act contract, then the use of the property would be managed as applicable in accordance with Kern County's *Agricultural Preserve Standard Uniform Rules*, which identify land uses that are compatible within agricultural preserves established under the Williamson Act.

Threshold 5. Convert Farmland to Non-agricultural Use

Impact AGR-3: The proposed project could convert farmland to a combined land use of groundwater recharge and agricultural production.

As stated above, the proposed project would involve construction of groundwater recharge facilities on the Stockdale Properties and water conveyance facilities including the Central Intake Pipeline and pump station, Central Intake Turnout, and Stockdale West Turnout. As Stockdale West recharge facilities are fully constructed, the features to be installed onsite include three new recovery wells and pump houses, recovery pipelines, and the Stockdale West Turnout. Current facilities at Stockdale East would be converted to recharge basins with earthen berms, two new recovery wells, on-site conveyance pipelines, a portion of the Central Intake Pipeline and pump station, and Central Intake Turnout. Offsite, the Central Intake Pipeline would involve construction of an underground pipeline and connection to Goose Lake Slough. Agricultural lands adjacent to the Central Intake alignment would be temporarily affected at the property edges, resulting in minor loss of productivity, but would not result in long-term conversion of

farmland to non-agricultural use. The third Stockdale project site would likely involve the construction of recharge facilities, recovery wells and associated facilities. The proposed project is compatible with land use on surrounding properties, which is primarily agriculture, groundwater recharge, and conveyance.

In addition, 165 acres of Stockdale East is under a Restrictive Use Agreement with SunEdison as offsite mitigation for loss of farmland due to the Adobe Solar project. The Agreement allows certain permitted uses, such as agricultural production and development of groundwater recharge facilities, as long as the land is used in a manner that ensures that the agricultural productive capacity of the restricted acreage is not significantly impaired. As stated previously, implementation of the proposed project would maintain potential for agricultural use at Stockdale East and would not conflict with the terms of this Restrictive Use Agreement.

Impact Determination

The proposed project would support agricultural resources in the region through groundwater recharge and conveyance facilities. The proposed project would be compatible with the goals and policies of the Kern County General Plan for protecting agricultural resources through the beneficial use of percolation basins and would reduce the potential for the Stockdale Properties and the Central Intake alignment to be converted to residential, commercial, and industrial uses. The proposed project would not indirectly induce further loss of farmland in the project area, as is typical of projects that convert agricultural lands to residential or commercial land uses.

The proposed project also would support agriculture in the Kern Fan area by reducing future overdraft conditions in the underlying groundwater basin. The proposed project would eliminate agricultural extractions that in the past have contributed to overdraft of the groundwater basin. Implementing a banking program requires that water be recharged and stored prior to extraction. Furthermore, agricultural land uses, such as annual farming, grazing, or fallowing, would be allowed within the basins at the Stockdale Properties when not operated for water recharge or water management purposes. In addition, Stockdale East would be used for commercial agricultural purposes as required by the Restricted Use Agreement. Depending on the location of the third Stockdale project site, farming or grazing also may be implemented in accordance with Kern County's *Standard Uniform Rules* and Mitigation Measure AGR-1. The proposed project would result in less than significant impacts to agricultural land uses.

Significance Conclusion

Less than Significant with Mitigation.

Mitigation Measures

Implement **Mitigation Measure AGR-1**.

References – Agriculture and Forestry Resources

California Department of Conservation, 2010. *Kern County Important Farmland 2010*. Sheet 2 of 3. Accessed at: ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2010/ker10_central.pdf, October 11, 2013.

California Department of Food and Agriculture (CDFA), 2012. *County Agricultural Statistics Review 2011-2012*. Accessed at: http://www.cdfa.ca.gov/statistics/pdfs/CoStatData2011-12.pdf, October 11, 2013.

Kern County, 2012a. *2012 Kern County Agricultural Crop Report*. Department of Agriculture and Measurement Standards. Accessed at: http://www.kernag.com/caap/crop-reports/crop10_19/crop2012.pdf, October 11, 2013.

Kern County, 2012b. *Kern County Ag Preserve Map*. Kern County Online Mapping System. 2012.

Kern County Planning Department, 2009. Agricultural Preserve Standard Uniform Rules, as amended, 06/2009.

Rosedale-Rio Bravo Water Storage District, 2013. *Baseline Documentation Report – Section 1*. Kern County, California.

3.3 Air Quality

This chapter provides an overview of the existing air quality at the project site and surrounding region, the regulatory framework, an analysis of potential impacts to air quality that would result from implementation of the project, and identification of mitigation measures.

3.3.1 Environmental Setting

Existing Air Quality Conditions

General Meteorology and Topography

The primary factors that determine air quality are the locations of air pollutant sources and the amounts of pollutants emitted. Meteorological and topographical conditions, however, also are important. Factors such as wind speed and direction, and air temperature gradients interact with physical landscape features to determine the movement and dispersal of criteria air pollutants.

The project lies within the San Joaquin Valley Air Basin (SJVAB), basically a flat area bordered on the east by the Sierra Nevada Mountains; on the west by the Coast Ranges; and to the south by the Tehachapi Mountains. Airflow in the SJVAB is primarily influenced by marine air that enters through the Carquinez Straits where the San Joaquin-Sacramento Delta empties into the San Francisco Bay (SJVAPCD, 2002). The region's topographic features restrict air movement through and out of the basin. As a result, the SJVAB is highly susceptible to pollutant accumulation over time (SJVAPCD, 2002). Frequent transport of pollutants into the SJVAB from upwind sources also contributes to poor air quality.

Wind speed and direction play an important role in dispersion and transport of air pollutants. During summer periods, winds usually originate from the north end of the San Joaquin Valley and flow in a south-southeasterly direction through the valley, through the Tehachapi pass and into the neighboring Southeast Desert Air Basin. During winter months, winds occasionally originate from the south end of the valley and flow in a north-northwesterly direction. Also, during winter months, the valley experiences light, variable winds, less than 10 miles per hour (mph). Low wind speeds, combined with low inversion layers in the winter, create a climate conducive to high concentrations of certain air pollutants.

The SJVAB has an inland Mediterranean climate that is characterized by warm, dry summers and cooler winters. Summer high temperatures often exceed 100 degrees Fahrenheit (°F), averaging from the low 90s in the northern part of the valley to the high 90s in the south. The daily summer temperature variation can be as high as 30 degrees °F. Winters are for the most part mild and humid. Average high temperatures during the winter are in the 50s, while the average daily low temperature is approximately 45 degrees °F.

The vertical dispersion of air pollutants in the valley is limited by the presence of persistent temperature inversions. Air temperatures usually decrease with an increase in altitude. A reversal of this atmospheric state, where the air temperature increases with height, is termed an inversion.

Air above and below an inversion does not mix because of differences in air density thereby restricting air pollutant dispersal.

Existing Air Quality in the Study Area Vicinity

The San Joaquin Valley Air Pollution Control District's (SJVAPCD) maintains a network of air quality monitoring stations located throughout the Basin. The monitoring stations record concentrations of various pollutants including: ozone; carbon monoxide (CO); nitrogen dioxide (NO_2); sulfur dioxide (SO_2); particulate matter less than 10 microns in diameter (PM_{10}); particulate matter less than 2.5 microns in diameter ($PM_{2.5}$); lead (Pb); and sulfates (SO_4). Monitored ambient air pollutant concentrations reflect the number and strength of emissions sources and the influence of topographical and meteorological factors. The station closest to and most representative of air quality conditions at the project site is at 578 Walker Street in Shafter. This monitoring site is approximately ten miles south of the project. The nearest monitoring station for PM_{10} and $PM_{2.5}$ is located in Bakersfield at 5558 California Avenue, approximately 29 miles southeast of the project. As PM is a localized pollutant, data from the California Avenue station would not be representative of concentrations in the project area. Besides, the California Avenue station is located within an urban area unlike the project area, which is rural in nature. **Table 3.3-1** presents the most recent three-year summary of air pollutant (concentration) data collected at the nearest monitoring stations for the three pollutants for which the SJVAB remains "nonattainment", ozone, PM_{10}, and $PM_{2.5}$. In **Table 3.3-1**, these measured air pollutant concentrations are compared with state and national ambient air quality standards.

Sensitive Receptors

Land uses such as schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because infants and children, the elderly, and people with health afflictions, especially respiratory ailments, are more susceptible than the general public. Residential areas are also considered to be sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Industrial and commercial districts are less sensitive to poor air quality because exposure periods are shorter and workers in these districts are, in general, the healthier segment of the public. The project site is located in a rural area characterized by agriculture uses. There are few sensitive land uses in the vicinity of the proposed project. The nearest residences are across Stockdale Highway, approximately 800 feet north of the Stockdale West site, as well as a cluster of residences approximately 200 feet north of the Stockdale East site, just east of Enos Lane. The only school in proximity of the proposed project is the Rio Bravo Greely School located adjacent to the northern boundary of the site radius for the third Stockdale project site, at the cross streets of Enos Lane and Rosedale Highway.

Criteria Air Pollutants

These pollutants are called "criteria" air pollutants because standards have been established for each of them to meet specific public health and welfare criteria set forth in the Federal Clean Air Act (FCAA). California has adopted more stringent ambient air quality standards for the criteria air pollutants (referred to as State Ambient Air Quality Standards, or state standards) and has adopted air quality standards for some pollutants for which there is no corresponding national standard.

TABLE 3.3-1
AIR QUALITY DATA SUMMARY (2010-2012)

Pollutant	Monitoring Data by Year		
	2011	**2012**	**2013**
Ozone – Walker St Station in Shafter			
Highest 1 Hour Average (ppm)[b]	**0.097**	**0.103**	**0.112**
Days over State Standard (0.09 ppm)[a]	1	5	1
Highest 8 Hour Average (ppm)[b]	**0.087**	**0.090**	**0.097**
Days over National Standard (0.075 ppm)[a]	18	30	6
Days over State Standard (0.07 ppm)[a]	43	64	21
Particulate Matter (PM_{10}) – California Ave Station in Bakersfield			
Highest 24 Hour Average – State/National ($\mu g/m^3$)[b]	**154.0**/97.4	**125.8**/99.6	**116.9**/120.7
Days (Measured) over National Standard (150 $\mu g/m^3$)[a,c]	0	0	0
Days (Measured) over State Standard (50 $\mu g/m^3$)[a,c]	113	55	16
State Annual Average (State Standard 20 $\mu g/m^3$)[a,b]	**44.2**	**41.4**	*
Particulate Matter ($PM_{2.5}$) – California Ave Station in Bakersfield			
Highest 24 Hour Average ($\mu g/m3$)[b] – National Measurement	**80.3**	**86.5**	**117.7**
Days (Measured) over National Standard (35 $\mu g/m^3$)[a,c]	30	22	44
State Annual Average (12 $\mu g/m3$)[b]	**18.1**	**17.9**	*

a Generally, state standards and national standards are not to be exceeded more than once per year.
b ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter.
c PM10 and PM2.5 is not measured every day of the year. Number of estimated days over the standard is based on 365 days per year.
* = Insufficient data available to determine value; NA = Not Available. Values in **Bold** exceed the respective air quality standard.
SOURCE: California Air Resources Board, 2015.

Ozone

Short-term exposure to ozone can irritate the eyes and cause constriction of the airways. Besides causing shortness of breath, ozone can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema.

Ozone, the main component of photochemical smog, is primarily a summer and fall pollution problem. Ozone is not emitted directly into the air but is formed through a complex series of chemical reactions involving other compounds that are directly emitted. These directly emitted pollutants (also known as ozone precursors) include reactive organic gases (ROG) and nitrogen oxides (NOx). The time period required for ozone formation allows the reacting compounds to spread over a large area, producing a regional pollution problem. Ozone problems are the cumulative result of regional development patterns rather than the result of a few significant emission sources. Once formed, ozone remains in the atmosphere for one or two days. Ozone is then eliminated through chemical reaction with plants (reacts with chemicals on the leaves of plants); rainout (attaches to water droplets as they fall to earth) and washout (absorbed by water molecules in clouds and later falls to earth with rain).

Carbon Monoxide

Ambient carbon monoxide concentrations normally are considered a local effect and typically correspond closely to the spatial and temporal distributions of vehicular traffic. Wind speed and atmospheric mixing also influence carbon monoxide concentrations. Under inversion conditions, carbon monoxide concentrations may be distributed more uniformly over an area that may extend some distance from vehicular sources. When inhaled at high concentrations, carbon monoxide combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia, as well as for fetuses.

Carbon monoxide concentrations have declined dramatically in California due to existing controls and programs and most areas of the state including the Station Area Plan region have no problem meeting the carbon monoxide state and federal standards. CO measurements and modeling were important in the early 1980's when CO levels were regularly exceeded throughout California. In more recent years, CO measurements and modeling have not been a priority in most California air districts due to the retirement of older polluting vehicles, less emissions from new vehicles and improvements in fuels. The clear success in reducing CO levels is evident in the first paragraph of the executive summary of the California Air Resources Board *2004 Revision to the California State Implementation Plan for Carbon Monoxide Updated Maintenance Plan for Ten Federal Planning Areas* (ARB, 2004), shown below:

> "The dramatic reduction in carbon monoxide (CO) levels across California is one of the biggest success stories in air pollution control. Air Resources Board (ARB or Board) requirements for cleaner vehicles, equipment and fuels have cut peak CO levels in half since 1980, despite growth. All areas of the State designated as non-attainment for the federal 8-hour CO standard in 1991 now attain the standard, including the Los Angeles urbanized area. Even the Calexico area of Imperial County on the congested Mexican border had no violations of the federal CO standard in 2003. Only the South Coast and Calexico continue to violate the more protective State 8-hour CO standard, with declining levels beginning to approach that standard."

Suspended Particulate Matter (PM10 and PM2.5)

PM_{10} and $PM_{2.5}$ consist of particulate matter that is 10 microns or less in diameter and 2.5 microns or less in diameter, respectively (a micron is one-millionth of a meter). PM_{10} and $PM_{2.5}$ represent fractions of particulate matter that can be inhaled into the air passages and the lungs and can cause adverse health effects. Some sources of particulate matter, such as wood burning in fireplaces, demolition, and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates also can damage materials and reduce visibility. Large dust particles (diameter greater than 10 microns) settle out rapidly and are easily filtered by human breathing passages. This large dust is of more concern as a soiling nuisance rather than a health hazard. The remaining fraction, PM_{10} and $PM_{2.5}$, are a health concern particularly at levels above the federal and state ambient air quality standards. $PM_{2.5}$ (including diesel exhaust particles) is thought to have greater effects on health, because these particles are

so small and thus, are able to penetrate to the deepest parts of the lungs. Scientific studies have suggested links between fine particulate matter and numerous health problems including asthma, bronchitis, acute and chronic respiratory symptoms such as shortness of breath and painful breathing. Recent studies have shown an association between morbidity and mortality and daily concentrations of particulate matter in the air. Children are more susceptible to the health risks of PM_{10} and $PM_{2.5}$ because their immune and respiratory systems are still developing.

Mortality studies since the 1990s have shown a statistically significant direct association between mortality (premature deaths) and daily concentrations of particulate matter in the air. Despite important gaps in scientific knowledge and continued reasons for some skepticism, a comprehensive evaluation of the research findings provides persuasive evidence that exposure to fine particulate air pollution has adverse effects on cardiopulmonary health (Dockery and Pope, 2006). The ARB has estimated that achieving the ambient air quality standards for PM_{10} could reduce premature mortality rates by 6,500 cases per year (ARB, 2002).

Nitrogen Dioxide (NO_2)

NO_2 is a reddish brown gas that is a by-product of combustion processes. Automobiles and industrial operations are the main sources of NO_2. Aside from its contribution to ozone formation, nitrogen dioxide can increase the risk of acute and chronic respiratory disease and reduce visibility. NO_2 may be visible as a coloring component of a brown cloud on high pollution days, especially in conjunction with high ozone levels.

Sulfur dioxide (SO_2)

SO_2 is a combustion product of sulfur or sulfur-containing fuels such as coal and diesel. SO_2 is also a precursor to the formation of atmospheric sulfate, particulate matter and contributes to potential atmospheric sulfuric acid formation that could precipitate downwind as acid rain. The maximum SO_2 concentrations recorded in the project area are well below federal and state standards. Accordingly, the region is in attainment status with both federal and state SO_2 standards.

Lead

Ambient lead concentrations meet both the federal and state standards in the project area. Lead has a range of adverse neurotoxin health effects, and was formerly released into the atmosphere primarily via leaded gasoline products. The phase-out of leaded gasoline in California resulted in dramatically reduced levels of atmospheric lead. The proposed project would not introduce any new sources of lead emissions; consequently, lead emissions are not required to be quantified and are not further evaluated in this analysis.

Non-Criteria Air Pollutants

Toxic Air Contaminants (TACs)

TACs are airborne substances that are capable of causing short-term (acute) and/or long-term (chronic or carcinogenic, i.e., cancer causing) adverse human health effects (i.e., injury or illness). TACs include both organic and inorganic chemical substances. They may be emitted from a variety of common sources including gasoline stations, automobiles, diesel engines, dry cleaners, industrial operations, and painting operations. TACs are regulated separately from the criteria air pollutants at both federal and state levels. At the federal level these airborne substances are referred to

as Hazardous Air Pollutants (HAPs). The state list of TACs identifies 243 substances and the federal list of HAPs identified 189 substances.

Diesel particulate matter (DPM) is the most complex of diesel emissions. Diesel particulates, as defined by most emission standards, are sampled from diluted and cooled exhaust gases. This definition includes both solids and liquid material that condenses during the dilution process. The basic fractions of DPM are elemental carbon, heavy hydrocarbons derived from the fuel and lubricating oil and hydrated sulfuric acid derived from the fuel sulfur. DPM contains a large portion of the polycyclic aromatic hydrocarbons (PAH) found in diesel exhaust. Diesel particulates include small nuclei mode particles of diameters below 0.04µm and their agglomerates of diameters up to 1µm. Ambient exposures to diesel particulates in California are significant fractions of total TAC exposure levels in the State.

Odorous Emissions

Because offensive odors rarely cause any physical harm and no requirements for their control are included in state or national air quality regulations, the SJVAPCD has no rules or standards related to odor emissions, other than its nuisance rule. Any actions related to odors are based on citizen complaints to local government agencies including the SJVAPCD. The SJVAPCD uses screening distances to determine the potential for odor impacts from various land uses.

3.3.2 Regulatory Setting

Regulation of air pollution is achieved through both national and state ambient air quality standards and through emissions limits on individual sources of air pollutants. Local Air Quality Management Districts (AQMD's) and Air Pollution Control Districts (APCD's) are responsible for demonstrating attainment with state air quality standards through the adoption and enforcement of Attainment Plans.

Federal

The FCAA requires the U.S. Environmental Protection Agency (EPA) to identify National Ambient Air Quality Standards (NAAQS), or (national standards) to protect public health and welfare. National standards have been established for ozone, CO, NO_2, SO_2, respirable particulate matter (PM10 and PM2.5), and lead. These pollutants are called "criteria" air pollutants because standards have been established for each of them to meet specific public health and welfare criteria set forth in the FCAA. California has adopted more stringent ambient air quality standards for the criteria air pollutants (referred to as State Ambient Air Quality Standards, or state standards) and has adopted air quality standards for some pollutants for which there is no corresponding national standard. **Table 3.3-2** presents current national and state ambient air quality standards and provides a brief discussion of the related health effects and principal sources for each pollutant.

Pursuant to the 1990 Federal Clean Air Act Amendments (FCAAA), the EPA classifies air basins (or portions thereof) as "attainment" or "nonattainment" for each criteria air pollutant, based on whether or not the NAAQS had been achieved. **Table 3.3-3** shows the current attainment status of the project area.

TABLE 3.3-2
STATE AND NATIONAL CRITERIA AIR POLLUTANT STANDARDS, EFFECTS, AND SOURCES

Pollutant	Averaging Time	State Standard	National Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Ozone	1 hour	0.09 ppm	---	High concentrations can directly affect lungs, causing irritation. Long-term exposure may cause damage to lung tissue.	Formed when reactive organic gases (ROG) and nitrogen oxides (NO_X) react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial / industrial mobile equipment.
	8 hours	0.07 ppm	0.075 ppm		
Carbon Monoxide	1 hour	20 ppm	35 ppm	Classified as a chemical asphyxiant, carbon monoxide interferes with the transfer of fresh oxygen to the blood and deprives sensitive tissues of oxygen.	Internal combustion engines, primarily gasoline-powered motor vehicles.
	8 hours	9.0 ppm	9 ppm		
Nitrogen Dioxide	1 hour	0.18 ppm	100 ppb	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown.	Motor vehicles, petroleum refining operations, industrial sources, aircraft, ships, and railroads.
	Annual Avg.	0.030 ppm	0.053 ppm		
Sulfur Dioxide	1 hour	0.25 ppm	75 ppb	Irritates upper respiratory tract; injurious to lung tissue. Can yellow the leaves of plants, destructive to marble, iron, and steel. Limits visibility and reduces sunlight.	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
	3 hours	---	0.5 ppm		
	24 hours	0.04 ppm	0.14 ppm		
	Annual Avg.	---	0.030 ppm		
Respirable Particulate Matter (PM_{10})	24 hours	50 ug/m^3	150 ug/m^3	May irritate eyes and respiratory tract, decreases in lung capacity, cancer and increased mortality. Produces haze and limits visibility.	Dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
	Annual Avg.	20 ug/m^3	---		
Fine Particulate Matter ($PM_{2.5}$)	24 hours	---	35 ug/m^3	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and results in surface soiling.	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; Also, formed from photochemical reactions of other pollutants, including NO_X, sulfur oxides, and organics.
	Annual Avg.	12 ug/m^3	12 ug/m^3		
Lead	Monthly Ave.	1.5 ug/m^3	---	Disturbs gastrointestinal system, and causes anemia, kidney disease, and neuromuscular and neurological dysfunction.	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
	Quarterly	---	1.5 ug/m^3		
Hydrogen Sulfide	1 hour	0.03 ppm	No National Standard	Nuisance odor (rotten egg smell), headache and breathing difficulties (higher concentrations)	Geothermal Power Plants, Petroleum Production and refining
Sulfates	24 hour	25 ug/m^3	No National Standard	Breathing difficulties, aggravates asthma, reduced visibility	Produced by the reaction in the air of SO2.
Visibility Reducing Particles	8 hour	Extinction of 0.23/km; visibility of 10 miles or more	No National Standard	Reduces visibility, reduced airport safety, lower real estate value, discourages tourism.	See PM2.5.

ppm = parts per million; ug/m^3 = micrograms per cubic meter.

SOURCE: California Air Resources Board, 2013. *Ambient Air Quality Standards.* http://www.arb.ca.gov/research/aaqs/aaqs2.pdf. Standards last updated June 4, 2013; California Air Resources Board, 2009b. *ARB Fact Sheet: Air Pollution Sources, Effects and Control*. http://www.arb.ca.gov/research/health/fs/fs2/fs2.htm. Page last reviewed by ARB December 2009.

TABLE 3.3-3
SAN JOAQUIN VALLEY ATTAINMENT STATUS

Pollutant	Designation/Classification	
	Federal Standards	State Standards
Ozone – one hour	No Federal Standard[1]	Nonattainment/Severe
Ozone – eight hour	Nonattainment/Extreme[2]	Nonattainment
PM_{10}	Attainment[3]	Nonattainment
$PM_{2.5}$	Nonattainment[4]	Nonattainment
CO	Unclassified/Attainment	Unclassified/Attainment
Nitrogen Dioxide	Unclassified/Attainment	Attainment
Sulfur Dioxide	Unclassified/Attainment	Attainment
Lead	No Designation	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified
Sulfates	No Federal Standard	Attainment
Vinyl Chloride	No Federal Standard	Attainment
Visibility Reducing Particles	No Federal Standard	Unclassified

1 Effective June 15, 2005, the U.S. Environmental Protection Agency (EPA) revoked the federal 1-hour ozone standard, including associated designations and classifications. EPA had previously classified the SJVAB as extreme nonattainment for this standard. EPA approved the 2004 Extreme Ozone Attainment Demonstration Plan on March 8, 2010 (effective April 7, 2010). Many applicable requirements for extreme 1-hour ozone nonattainment areas continue to apply to the SJVAB.
2 Though the Valley was initially classified as serious nonattainment for the 1997 8-hour ozone standard, EPA approved Valley reclassification to extreme nonattainment in the Federal Register on May 5, 2010 (effective June 4, 2010).
3 On September 25, 2008, EPA redesignated the San Joaquin Valley to attainment for the PM10 National Ambient Air Quality Standard (NAAQS) and approved the PM10 Maintenance Plan.
4 The Valley is designated nonattainment for the 1997 PM2.5 NAAQS. EPA designated the Valley as nonattainment for the 2006 PM2.5 NAAQS on November 13, 2009 (effective December 14, 2009.

SOURCE: SJVAPCD, 2013a, *Ambient Air Quality Standards and Valley Attainment Status*, www.valleyair.org/aqinfo/attainment.htm, accessed December 16, 2013.

The FCAA required each state to prepare an air quality control plan referred to as the State Implementation Plan (SIP). The FCAAA added requirements for states containing areas that violate the NAAQS to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is a living document that is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of air basins as reported by the agencies with jurisdiction over them. The EPA has responsibility to review all state SIPs to determine if they conform to the mandates of the FCAAA and will achieve air quality goals when implemented. If the EPA determines a SIP to be inadequate, it may prepare a Federal Implementation Plan (FIP) for the nonattainment area and may impose additional control measures. Failure to submit an approvable SIP or to implement the plan within mandated timeframes can result in sanctions being applied to transportation funding and stationary air pollution sources in the air basin.

Regulation of TACs, termed HAPs under federal regulations, is achieved through federal, State and local controls on individual sources. The SJVAPCD regulates toxic air contaminants in District Policies 1905 and 1910, and in regulation VII. The district recognizes all TAC's as defined by the State. The district recognizes federal Maximum Achievable Control Technology (MACT) standards for HAP's in District Rule 4002. The 1977 Clean Air Act Amendments required the EPA to identify National Emission Standards for Hazardous Air Pollutants (NESHAPs) to protect public health and welfare. These substances include certain volatile organic chemicals,

pesticides, herbicides, and radionuclides that present a tangible hazard, based on scientific studies of exposure to humans and other mammals.

State

The ARB manages air quality, regulates mobile emissions sources, and oversees the activities of county APCDs and regional AQMDs. ARB establishes state ambient air quality standards and vehicle emissions standards.

California has adopted ambient standards that are more stringent than the federal standards for the criteria air pollutants. These are shown in **Table 3.3-2**. Under the California Clean Air Act (CCAA) patterned after the FCAA, areas have been designated as attainment or nonattainment with respect to the state standards. **Table 3.3-3** summarizes the attainment status with California standards in the project area.

Toxic Air Contaminants (TACs)

The State Air Toxics Program was established in 1983 under Assembly Bill (AB) 1807 (Tanner). A total of 243 substances have been designated TACs under California law; they include the 189 (federal) HAPs adopted in accordance with AB 2728. The Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588) seeks to identify and evaluate risk from air toxics sources; however, AB 2588 does not regulate air toxics emissions. Toxic air contaminant emissions from individual facilities are quantified and prioritized. "High-priority" facilities are required to perform a health risk assessment and, if specific thresholds are violated, are required to communicate the results to the public in the form of notices and public meetings.

In August of 1998, ARB identified particulate emissions from diesel-fueled engines (diesel particulate matter, or DPM) as TACs. ARB subsequently developed the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles* (ARB, 2000). The document represents proposals to reduce diesel particulate emissions, with the goal of reducing emissions and associated health risks by 75 percent in 2010 and by 85 percent in 2020. The program aims to require the use of state-of-the-art catalyzed diesel particulate filters and ultra low sulfur diesel fuel on diesel-fueled engines.

ARB published the *Air Quality and Land Use Handbook: A Community Health Perspective* (ARB, 2005) with the goal of providing information that will help keep California's children and other vulnerable populations out of harm's way with respect to nearby sources of air pollution. The handbook highlights recent studies that have shown that public exposure to air pollution can be substantially elevated near freeways and certain other facilities. However, the health risk is greatly reduced with distance. For that reason, ARB provided some general recommendations aimed at keeping appropriate distances between sources of air pollution and sensitive land uses, such as residences.

Local

The SJVAPCD is the primary local agency responsible for protecting human health and property from the harmful effects of air pollution in the SJVAB, and has jurisdiction over most stationary

source air quality matters in the SJVAB, including the NSPS program. The SJVAPCD includes all of Merced, San Joaquin, Stanislaus, Madera, Fresno, Kings and Tulare counties, and the Valley portion of Kern County.

The SJVAPCD is responsible for developing attainment plans for the SJVAB, for inclusion in California's SIP, as well as establishing and enforcing air pollution control rules and regulations. The attainment plans must demonstrate compliance with federal and state ambient air quality standards, and must first be approved by ARB before inclusion into the SIP. The SJVAPCD regulates, permits, and inspects stationary sources of air pollution. Among these sources are industrial facilities, gasoline stations, auto body shops, MSW landfills and dry cleaners to name a few. While the state is responsible for emission standards and controlling actual tailpipe emissions from motor vehicles, the SJVAPCD is required to regulate emissions associated with stationary sources such as agricultural burning and industrial operations. The SJVAPCD also works with eight local transportation planning agencies to implement transportation control measures, and to recommend mitigation measures for new growth and development designed to reduce the number of cars on the road. The SJVAPCD promotes the use of cleaner fuels, and funds a number of public and private agency projects that provide innovative approaches to reducing air pollution from motor vehicles.

While all criteria pollutants are a concern of the SJVAPCD, a project's air quality impacts are considered significant if they would violate any of the state air quality standards. Ozone precursors, PM10 emissions and toxic air contaminants are emphasized in the review of applications for an Authority to Construct / Permit to Operate. Federal and state air quality regulations also require regions designated as nonattainment to prepare plans that either demonstrate how the region will attain the standard or that demonstrate reasonable improvement in air quality conditions. As noted, the SJVAPCD is responsible for developing attainment plans for the SJVAB for inclusion in California's SIP.

The SJVAPCD's primary means of implementing air quality plans is by adopting and enforcing rules and regulations. Stationary sources within the jurisdiction are regulated by the District's permit authority over such sources and through its review and planning activities. In 2001, the SJVAPCD revised its Regulation VIII-Fugitive PM Prohibitions, in response to commitments made in the 1997 PM_{10} Attainment Plan to incorporate best available control measures (BACM). The revision also includes new rules for open areas and agricultural operations. The provisions of the revised regulation took effect in May 2002. Regulation VIII consists of a series of dust control rules that emphasize reducing fugitive dust as a means of achieving attainment of the federal standards for PM_{10}.

Regulation VIII specifically addresses the following activities:

- Rule 8011: General Requirements;
- Rule 8021: Construction, Demolition, Excavation, Extraction and other Earthmoving Activities;
- Rule 8031: Bulk Materials;
- Rule 8041: Carryout and Trackout;

- Rule 8051: Open Areas;
- Rule 8061: Paved and Unpaved Roads; and
- Rule 8071: Unpaved Vehicle/Equipment Traffic Areas.

Also, District Rule 9510 Indirect Source Review (ISR) was adopted December 15, 2005. ISR was adopted to fulfill the District's emission reduction commitments in the PM_{10} and Ozone Attainment Plans. ISR requires submittal of an Air Impact Assessment (AIA) application no later than the date on which application is made for a final discretionary approval from the public agency. The AIA will be the information necessary to calculate both construction and operational emissions of a development project. The Project would be likely be required to comply with Rule 9510 since it includes 9,000 square feet of space not identified in District Rule 9510 section 2.0 (Applicability)[1] and would qualify as a "Development Project" under section 3.13 of Rule 9510.

Section 6.0 of the Rule outlines general mitigation requirements for developments that include reduction in construction emissions of 20 percent of the total construction NOx emissions, and 45 percent of the total construction PM_{10} exhaust emissions. Section 6.0 of the Rule also requires the project to reduce operational NOx emissions by 33.2 percent and operational PM_{10} emissions by 50 percent. Section 7.0 of the Rule includes fee schedules for construction or operational excess emissions of NOx or PM_{10}; those emissions above the goals identified in Section 6.0 of the Rule. Section 7.2 of the Rule identifies fees for excess emissions that are $9,350/ton for NOx emissions for year 2008 and beyond, and $9,011/ton for PM_{10} emissions for year 2008 and beyond.

Other SJVAPCD Rules and Regulations that may apply to the project, but not limited to, Rule 4102 (Nuisance), Rule 4641(Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations), Rule 2010 (Permits Required), and Rule 2201 (New and Modified Stationary Source Review).

The SJVAPCD's Governing Board has also recently adopted the 2008 $PM_{2.5}$ Plan. This plan highlights a variety of measures designed to achieve all the $PM_{2.5}$ standards - the 1997 federal standards, the 2006 federal standards, and the state standard - as soon as possible.

Kern County General Plan

The Kern County General Plan Land Use/ Conservation /Open Space chapter contains the County's Air Quality Element (Kern County Planning Department, 2009). The following policies that would be relevant to the project:

> **Policy 1.10.2.19:** In considering discretionary projects for which an Environmental Impact Report must be prepared pursuant to the California Environmental Quality Act, the appropriate decision making body, as part of its deliberations, will ensure that:

[1] The "9,000 square feet of space not identified" is a District Rule 9510 category that captures development projects that do not include the following uses identified in Rule 9510: residential units, commercial space, light industrial space, heavy industrial space, medical office space, general office space, educational space, government space, or recreational space.

- All feasible mitigation to reduce significant adverse air quality impacts have been adopted; and
- The benefits of the proposed project outweigh any unavoidable significant adverse effects on air quality found to exist after inclusion of all feasible mitigation. This finding shall be made in a statement of overriding considerations and shall be supported by factual evidence to the extent that such a statement is required pursuant to the California Environmental Quality Act.

Policy 1.10.2.20: The County shall include fugitive dust control measures as a requirement for discretionary projects and as required by the adopted rules and regulations of the San Joaquin Valley Unified Air Pollution Control District and the Kern County Air Pollution Control District on ministerial permits.

Policy 1.10.2.21: The County shall support air districts' efforts to reduce PM_{10} and $PM_{2.5}$ emissions.

Policy 1.10.2.22: Kern County shall continue to work with the San Joaquin Valley Unified Air Pollution Control District and the Kern County Air Pollution Control District toward air quality attainment with Federal, State, and local standards.

Policy 1.10.2.23: The County shall continue to implement the local government control measures in coordination with the Kern Council of Governments and the San Joaquin Valley Unified Air Pollution Control District.

3.3.3 Impact Assessment

Thresholds of Significance

According to Appendix G of the CEQA *Guidelines*, a project would have a significant effect on air quality if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any nonattainment pollutant (including releasing emissions that exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

Criteria Pollutants

For construction impacts, the pollutant of greatest concern to the SJVAPCD is PM_{10}.[2] The SJVAPCD recommends that significance be based on a consideration of the control measures to be

[2] Construction equipment also emits carbon monoxide and ozone precursors. The SJVAPCD has determined that these emissions would cause a significant air quality impact only in the case of a very large or very intense construction project (SJVAPCD, 2002).

implemented during project construction (SJVAPCD, 2002). The SJVAPCD *Guide for Assessing and Mitigating Air Quality Impacts* (*GAMAQI*) contains a list of feasible control measures for construction-related PM_{10} emissions. The SJVAPCD's *GAMAQI* also includes significance criteria for evaluating operational-phase emissions from direct and indirect sources associated with a project. Indirect sources include motor vehicle traffic resulting from the project and do not include stationary sources covered under permit with the SJVAPCD.

For this analysis, the project would be considered to have a significant effect on the environment during short-term construction or long-term operations if it would exceed the following thresholds:

- Cause a net increase in pollutant emissions greater than 10 tons per year of ROG, 10 tons per year of NOx, or 15 tons per year of PM_{10}. These thresholds are recommended by the SJVAPCD (SJVAPCD, 2013b) and Kern County (Kern County, 2006).
- Cause a violation of state CO concentration standards. The level of significance of CO emissions from mobiles sources is determined by modeling the ambient concentration under project conditions and comparing the resultant 1- and 8-hour concentrations to the respective state CO standards of 20.0 and 9.0 parts per million.
- Cause "visible dust emissions" due to onsite operations and thereby violate SJVAPCD Regulation VIII.[3]

Stationary sources that comply, or that would comply, with SJVAPCD Rules and Regulations are generally not considered to have a significant air quality impact.

Toxic Air Contaminants

The operation of any project with the potential to expose sensitive receptors to substantial levels of TACs would be deemed to have a potentially significant impact. More specifically, proposed development projects that have the potential to expose the public to TACs in excess of the following thresholds would be considered to have a significant air quality impact:

- Probability of contracting cancer for the Maximally Exposed Individual[4] (MEI) exceeds 10 in one million.
- Ground-level concentrations of non-carcinogenic TACs would result in a Hazard Index greater than 1 for the MEI.

Methodology

Construction and operational emissions were calculated by using California Emissions Estimator Model (CalEEMod) version 2013.2.2. CalEEMod is the SJVAPCD-recommended computer program that can be used to estimate anticipated emissions associated with land development projects in California. CalEEMod has separate databases for specific counties and air districts.

3 Visible dust is defined by the SJVAPCD as "visible dust of such opacity as to obscure an observer's view to a degree equal to or greater than an opacity of 40 percent, for a period or periods aggregating more than three minutes in any one hour."

4 MEI represents the worst-case risk estimate based on a theoretical person continuously exposed for 70 years at the point of highest compound concentration in air.

The Kern County – San Joaquin database was used for the proposed project. The model calculates criteria pollutant emissions, including CO, PM_{10}, $PM_{2.5}$ and the ozone precursors ROG and NOx.

For project construction, it was assumed that the majority of earthwork would be conducted at the Stockdale East site and that the Stockdale East and Stockdale West properties and the Central Intake would be built out in six phases (six months per phase) rather than all at once. The phases, which were assumed to start in late summer 2015, included the following: construction of the basins and CVC turnouts; construction of the wells (two phases);construction of the wellheads and pipelines (two phases); and construction of the Central Intake Pipeline. As described in the Project Description, there is also a third Stockdale project site that has yet to be identified. However, it is likely that annual construction activities and emissions would be similar to those analyzed below.

Operational emissions were modeled for the worse-case year in which maintenance earthwork could occur on two of the project sites within the same year. Periodic earthwork operations would be required to maintain levees, enhance soil permeability, and remove vegetative growth. Earthwork would involve disking or scraping the basins to remove the top layer (e.g., one inch) of sediment, approximately once every three years for a maximum of four weeks per year on each property. Otherwise, the typical year operations would consist of only periodic on-road trips for periodic inspection and minor maintenance.

For this analysis, the results are expressed in tons per year and are compared with the SJVAPCD and Kern County mass thresholds to determine impact significance. **Appendix C** of this Draft EIR provides detailed emission calculations used in this analysis.

Impacts and Mitigation Measures

Threshold 1. Air Quality Plan

Impact AQ-1: The proposed project could conflict with or obstruct implementation of SJVAPCD air quality plan.

If a City or County's General Plan is consistent with the most recently adopted clean air plan, a project that is consistent with the General Plan's land use designation is considered consistent with applicable air quality plans and policies. As stated in Chapter 3.10, Land Use and Planning, the proposed project would be consistent with the Kern County land use designations and zoning for the project area. In addition, the County General Plan is consistent with the applicable air quality plan because data and projections from the General Plans are incorporated into the clean air plans. Development of the proposed project would not interfere with population and long-term vehicle-miles-traveled (VMT) projections used to develop the air quality plan projections as it would not increase the population of the area and operational VMT traveled would be negligible. Therefore, the proposed project would result in a less-than-significant impact because it would not conflict with the applicable air quality management plan.

Significance Determination

Less than Significant.

Mitigation Measures

None required.

Threshold 2. Air Quality Standard Violation

Impact AQ-2: Construction and/or operation of the project could generate emissions of criteria air pollutants that could contribute to existing nonattainment conditions.

Construction

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; (4) architectural coatings; and (5) asphalt paving.

PM_{10} and $PM_{2.5}$ 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. Larger-diameter dust particles (i.e., greater than 30 microns) generally fall out of the atmosphere within several hundred feet of construction sites, and represent more of a soiling nuisance than a health hazard. Smaller-diameter particles (e.g., PM_{10} and $PM_{2.5}$) are associated with adverse health effects and generally remain airborne until removed from the atmosphere by moisture. Therefore, unmitigated construction dust emissions could result in significant local effects. The SJVAPCD recommends that determination of significance with respect to fugitive dust be based upon inclusion of feasible control measures for PM_{10} and compliance with Regulation VIII, Rule 8011, of the District's Rules and Regulations.

For all construction projects, implementation of all Regulation VIII fugitive dust control measures are required by law. Implementation of the Regulation VIII fugitive dust control measures and all additional feasible measures would reduce construction PM_{10} emissions associated with the project to a less-than-significant level, based on the short-term exposure of any single sensitive receptor to residual fugitive dust emissions.

In addition, construction equipment and construction-worker commute vehicles would also generate criteria air pollutant emissions. Criteria pollutant emissions of ROG and NOx from these emissions sources would incrementally add to regional atmospheric loading of ozone precursors during the construction period. In addition, the project would need to comply with District Rule 9510, which would reduce emissions of NOx and PM_{10} during project construction. Construction emissions were modeled using CalEEMod, and are depicted below in **Table 3.3-4**. For the third Stockdale project site that has yet to be identified, it is likely that annual construction activities and emissions would be similar to those described below.

As depicted in Table 3.3-4, the estimated emissions from construction would not exceed applicable significance thresholds. However, as discussed above, the project applicant would still need to comply with all applicable SJVAPCD rules and regulations, including Rule 8011 (fugitive dust control measures) and Rule 9510 (indirect source review). No additional mitigation measures would be required.

TABLE 3.3-4
UNMITIGATED PROJECT CONSTRUCTION EMISSIONS (TONS PER YEAR)

Pollutant	Significance Thresholds (tons/yr)	Unmitigated Project Construction Emissions (tons/yr)[a]			
		Year 1 (2015)	Year 2 (2016)	Year 3 (2017)	Year 4 (2018)
ROG	10	0.45	0.52	0.50	0.11
NOx	10	5.03	4.46	3.89	0.99
PM_{10}	15	4.09	6.35	6.30	3.12
$PM_{2.5}$	NA[c]	0.86	0.88	0.85	0.37
CO	NA[c]	3.50	3.07	2.98	0.94

a The same thresholds of significance are established by the SJVAPCD and Kern County. CO and $PM_{2.5}$ do not have an established emissions threshold of significance.
b **Bold** values are in excess of applicable standard. Emission factors were generated by CalEEMod for Kern County – San Joaquin portion. These emission estimates do not account for the reductions achieved in compliance with Rule 8011 and Rule 9510. Construction was assumed to begin in 2015 and progress over a period of six phases (six months per). Excavated soil was assumed to be balanced on-site. Up to 20 workers were assumed to be needed for each phase of construction. Additional information is provided in Appendix C.
c No Applicable thresholds have been established for the emission of these pollutants.

Operations

Over the long-term, the project would result in an increase in emissions primarily due to triennial earthwork activities and routine inspection on-road trips. Operational emissions were calculated using CalEEMod for the worse-case scenario, assuming that maintenance earthwork could occur on two of the project sites within the same year. As this is an unlikely scenario, the assessment below would encapsulate the potential operational emissions for all sites, including the third Stockdale project site that has yet to be identified. Earthwork activities would occur for a duration of four weeks and would include the operation of a grader, loader, and tractor. Operational emissions are shown in **Table 3.3-5**. Notably, for the typical year, operations would consist of only minimal on-road trips for periodic inspection and maintenance and the associated emissions would be substantially less than those presented below.

As depicted in Table 3.3-5, the estimated emissions from operations would not exceed the applicable significance thresholds. However, as discussed above, the project applicant would still need to comply with all applicable SJVAPCD rules and regulations. No additional mitigation measures would be required.

TABLE 3.3-5
PROJECT OPERATIONAL EMISSIONS (TONS PER YEAR)

		Unmitigated Operation Emissions (tons/yr)[b]	
Pollutant	**Significance Thresholds (tons/yr)**	**Unmitigated Year 4 (2018)**	**Significant (Yes or No)?**
ROG	10	0.0	No
NO_x	10	0.3	No
PM_{10}	15	0.6	No
$PM_{2.5}$	NA[c]	0.1	NA
CO	NA[c]	0.2	NA

a The same thresholds of significance are established by the SJVAPCD and Kern County. CO and $PM_{2.5}$ do not have an established emissions threshold of significance.
b **Bold** values are in excess of applicable standard. Emission factors were generated by CalEEMod for Kern County – San Joaquin portion. These emission estimates do not account for the reductions achieved in compliance with Rule 8011 and Rule 9510. Additional information is provided in Appendix C.
c No Applicable thresholds have been established for the emission of these pollutants.

Significance Determination

Less than Significant.

Mitigation Measures

None required.

Threshold 3. Cumulative Air Quality

Impact AQ-3: Construction and operation of the project could result in cumulatively considerable increases of criteria pollutant emissions.

According to the SJVAPCD *GAMAQI*, a cumulative impact occurs when two or more individual effects, considered together, are considerable or would compound or increase other environmental impacts. Cumulative impacts can result from individually minor but collectively significant impacts, meaning that the project's incremental effects are considerable when viewed in connection with the effects of past, current, and probable future projects. According to the Kern County *Guidelines for Preparing an Air Quality Assessment for Use in Environmental Impact Reports*, the established thresholds of significance (10 tons per year ROG or NOx and 15 tons per year PM_{10}) determine whether or not a project would result in individual as well as cumulatively considerable impacts. Thus, any project that would individually have a significant air quality impact would also be considered to have a significant cumulative air quality impact and any project that would individually have a less than significant air quality impact would also be considered to have a less than significant cumulative air quality impact.

Construction emissions from the project would result in the generation of air pollutants in the project area and in the immediate vicinity, and would incrementally add to cumulative emissions. The project would also add to ozone precursor emissions on a regional basis and would

incrementally add to PM_{10} and CO emissions on a local basis. For operations, on-road traffic would be minimal and would result in a negligible increase in criteria pollutant emissions. Triennial earthwork operations would also result in minor increases in criteria pollutant emissions. As described in Impact AQ-2, short-term project construction and long-term project operations would result in a less-than-significant individual project impact. The project would not result in cumulatively considerable increases of criteria air pollutants.

Significance Determination

Less than Significant.

Mitigation Measures

None required.

Threshold 4. Sensitive Receptor Exposure

Impact AQ-4: Construction and/or operation of the project could expose sensitive receptors to substantial pollutant concentrations.

Carbon Monoxide (CO) Hotspots

CO is a localized pollutant of concern. Due to the distance between construction activities and sensitive receptors, construction would not emit CO in quantities that could pose health concerns. Also, due to the existing low concentrations of CO in the area that are projected to further decline in the future[5], project operations would not result in or contribute to CO concentrations that exceed the California 1-hour or 8-hour ambient air quality standards. Long-term operations would result in minimal CO emissions associated with routine inspection vehicle trips and triennial earthwork activities. Thus, mobile-source emissions of CO would not result in or contribute substantially to an air quality violation. The short-term construction and long-term operational mobile-source impact of the project on CO concentrations would be less-than-significant and no mitigation is required.

Toxic Air Contaminants

Construction of the proposed project would result in short-term diesel exhaust emissions (DPM), which are TACs, from on-site heavy-duty equipment. Project construction would generate DPM emissions from the use of off-road diesel equipment required for site grading and excavation, and other construction activities. The dose to which sensitive receptors are exposed is the primary factor used to determine health risk. Dose is a function of the concentration of a substance or substances in the environment and the extent of exposure that person has with the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the maximally exposed individual. Thus, the risks estimated for a maximally exposed individual are higher if a fixed exposure occurs over a longer period of time. According to the Office of Environmental Health Hazard Assessment (OEHHA), health risk assessments, which determine the exposure of sensitive receptors to toxic emissions, should be based on a 70-year exposure period; however, such assessments should be limited to the period/duration of activities

[5] See air quality setting information above that discusses the current success statewide in reducing CO levels.

associated with the project. Thus, the duration of the proposed construction activities (3 year) would only constitute approximately 4 percent of the total 70-year exposure period. In addition, the majority of project construction activity would occur at a substantial distance from sensitive receptors. Because the use of mobilized equipment would be temporary and there are no sensitive receptors located immediately adjacent to areas where construction would occur for prolonged periods, DPM from construction activities would not be anticipated to result in the exposure of sensitive receptors to levels that exceed applicable standards. Development of the third Stockdale project site would be similar, but would likely expose different receptors to DPM based on the land uses in the area and the size of the sites.

In addition, the long-term operation of the project would result in minimal TAC emissions associated with routine inspection vehicle trips and triennial earthwork activities. Earthwork would involve disking or scraping the basins to remove the top layer (e.g., one inch) of sediment, approximately once every three years for a maximum of four weeks per year on each property. Typical year operations would consist of only on-road trips for periodic inspection and minor maintenance. As a result, exposure of sensitive receptors to substantial toxic air emissions from the project would be less-than-significant.

Significance Determination

Less than Significant.

Mitigation Measures

None required.

Threshold 5. Odors

Impact AQ-5: Operation of the project could create objectionable odors affecting a substantial number of people.

Types of land uses that typically pose potential odor problems include agriculture, wastewater treatment plants, food processing and rendering facilities, chemical plants, composting facilities, landfills, waste transfer stations, and dairies. In addition, the occurrence and severity of odor impacts depend on numerous factors, including the nature, frequency, and intensity of the source; wind speed and direction; and the presence of sensitive receptors. Although offensive odors rarely cause any physical harm, they can still be very unpleasant, leading to considerable distress and often generating citizen complaints to local governments and regulatory agencies.

The proposed project does not include any of the above-mentioned land use activities, with the exception of agriculture. However, agricultural land uses are part of the baseline conditions for the project sites and surrounding area. Therefore, the proposed project would not change baseline conditions to introduce new land uses that would create objectionable odors. Occasionally, diesel exhaust from heavy equipment used during construction activities or during operational maintenance activities can generate objectionable odors, but these dissipate very quickly. Thus, neither construction nor the operation of the project would create objectionable odors affecting a substantial number of people, and odor impacts would be less-than-significant.

Significance Determination

Less than Significant.

Mitigation Measures

None required.

References – Air Quality

California Air Resources Board (ARB), 2000. *Risk Reduction Plan for Diesel-Fueled Engines and Vehicles*, October 2000.

California Air Resources Board (ARB), 2002. *Public Hearing to Consider Amendments to the Ambient Air Quality Standards for Particulate Matter and Sulfates*. May 3, 2002.

California Air Resources Board (ARB), 2004. *2004 Revisions to the California State Implementation Plan for Carbon Monoxide*. July 22, 2004.

California Air Resources Board (ARB), 2005. *Air Quality and Land Use Handbook: A Community Health Perspective*, April 2005.

California Air Resources Board (ARB), 2009. *ARB Fact Sheet: Air Pollution Sources, Effects and Control*, www.arb.ca.gov/research/health/fs/fs2/fs2.htm, page last reviewed December 2, 2009.

California Air Resources Board (ARB), 2013. *Ambient Air Quality Standards*. http://www.arb.ca.gov/research/aaqs/aaqs2.pdf. Standards last updated June 4, 2013.

California Air Resources Board (ARB), 2015. *iADAM: Air Quality Data Statistics*, http://www.arb.ca.gov/adam/topfour/topfour2.php, accessed February 6, 2015.

Dockery, D. W., and Pope, C.A., III. 2006. *Health Effects of Fine Particulate Air Pollution: Lines that Connect*. Journal Air & Waste Management Association, pp. 709–742. June.

Kern County, 2006. *Guidelines for Preparing an Air Quality Assessment for Use in Environmental Impact Report*s, December 1, 2006.

Kern County, 2009. *Kern County General Plan*. Last amended September 22, 2009.

San Joaquin Valley Air Pollution Control District (SJVAPCD), 2002. *Guide for Assessing and Mitigating Air Quality Impacts.* Adopted August 20, 1998; January 10, 2002 revision.

San Joaquin Valley Air Pollution Control District (SJVAPCD), 2013a. *Ambient Air Quality Standards and Valley Attainment Status*, www.valleyair.org/aqinfo/attainment.htm, accessed December 16, 2013.

San Joaquin Valley Air Pollution Control District (SJVAPCD), 2013b. Stockdale Integrated Banking Project NOP Comment Letter, dated October 24, 2013.

3.4 Biological Resources

This chapter describes the environmental setting for biological resources, the applicable regulatory framework, potential impacts of the proposed project, and mitigation measures to reduce those impacts to a level of less than significant. The analysis is supported by the *Biological Resources Technical Report for the Stockdale West Banking Project*, included as **Appendix D-1**. The Technical Report includes a reconnaissance level survey at Stockdale East, Stockdale West and surrounding areas, to identify vegetation and wildlife, and to delineate potential wetlands and waters of the United States (U.S.) that occur at the project site.

3.4.1 Environmental Setting

Methodology

The setting and analysis of biological resources is based on consultation with resource agencies, extensive field surveys within the project study area, and review of available literature as listed below.

- *Biological Resources Technical Report for the Stockdale West Banking Project* (ESA, 2013); Included with this EIR as Appendix D-1
- *Final Environmental Impact Report for the Strand Ranch Integrated Banking Project* (ESA 2008)
- *Metropolitan Bakersfield Habitat Conservation Plan* (City of Bakersfield and Kern County 2002)
- California Department of Fish and Wildlife California Natural Diversity Data Base (CNDDB) (CDFW 2012a)
- State and federally listed endangered and threatened animals of California (CDFW 2011)
- Inventory of Rare and Endangered Vascular Plants of California (online edition, v7-09a). (CNPS 2012)
- Review of relevant literature on biological resources on and around the project site
- Review of maps and aerial photographs of the project and the project vicinity
- United States Fish and Wildlife Service Critical Habitat Mapper online (USFWS 2012a)
- United States Fish and Wildlife Service National Wetlands Inventory online wetlands mapper (USFWS 2012b)
- United States Fish and Wildlife Service Species Reports (Environmental Conservation Online System)
- United States Department of Agriculture Soil Survey Geographic Data Base online (USDA 2012)

Regional Setting

The project site is located in the San Joaquin Valley and in Kern County near the cities of Bakersfield, Wasco, McFarland and Shafter and within the Pacific Flyway.[1] This area is also located within the California Floristic Province (CA-FP), Great Central Valley (GV) Region, San Joaquin Valley (SnJV) Subregion (Hickman, 1993). The CA-FP is the largest geographic unit in California and comprises much of the state west of the dry regions of the Great Basin (GB) and Desert (D) Provinces in northern and southern California (Hickman, 1993). The GV Region is entirely contained within the CA-FP, is roughly the same area as the California Central Valley, and was once comprised of grassland (California prairie), marshes, extensive riparian woodlands, and islands of valley-oak savanna, but is now predominantly agricultural (Hickman, 1993). The GV Region is divided into two subregions: the Sacramento Valley (ScV) Subregion to the north and the SnJV Subregion to the south (Hickman, 1993). The SnJV Subregion is the larger subregion and is hotter and drier than the ScV Subregion with desert elements in the south (Hickman, 1993). Land use within the vicinity of the proposed project is primarily agriculture.

The climate of the project area is characterized by hot, dry summers with daytime temperatures frequently above 100 degrees Fahrenheit (NOAA, 2012). The winter months are cool and foggy with temperatures seldom below freezing and, on average, there are between 250 and 300 frost-free days per year. Average rainfall is less than 10 inches per year with the heaviest rains occurring between January and March (NOAA, 2012).

Local Setting

The proposed project consists of the Stockdale East property, the Stockdale West property, and a third property that would be located within a designated radius around both sites (collectively referred to as the "Stockdale Properties"). The project also includes the Central Intake Pipeline alignment, which runs between Stockdale East and the Goose Lake Slough. The Stockdale East property is currently used for agriculture supporting crops such as onion (*Allium* sp.), alfalfa (*Medicago sativa*), and cotton (*Gossypium* sp.). The southwest corner of the property has been left fallow. Several structures and open storage areas comprised of bare ground have been developed for the operation and maintenance of the fields. There is also a small vegetated recharge basin in the northwest corner of the property. Residential houses and buildings associated with surrounding agricultural land uses occur to the north of the property, across Stockdale Highway. Agriculture, as well as a railroad track and loading station associated with a local business, occur to the east of the property. The Pioneer Canal directly abuts the southern boundary and is dry during the summer months. The canal consists of an unpaved channel comprised of dirt and sandy soils dominated by weedy plant species, such as Russian thistle (*Salsola tragus*), which is typically found in disturbed areas. Its sandy berms provide habitat (breeding and foraging) for numerous local and migratory species of wildlife. South of the Pioneer Canal is the CVC, a lined canal with consistent, year-round water flow. The land south of the CVC is open land and includes recharge basins owned and maintained by the Kern Water Bank Authority (KWBA). The alignment for the Central Intake Pipeline north of Stockdale East

[1] The Pacific Flyway is an established air route of waterfowl and other birds migrating between wintering grounds in Central and South America and nesting grounds in Pacific Coast and provinces of North America.

would cross existing agricultural and vacant lands and would connect to the south levee of Goose Lake Slough, north of Brimhall Road. The habitat along the Central Intake alignment consists of developed agriculture dominated by almond (*Prunus* sp.) orchards, disturbed non-native grasslands, and developed roads and a railroad. Portions of the Central Intake alignment will occur within disturbed bare ground within the understory of the orchards. The northern extent of the Central Intake alignment will connect with the Goose Lake Slough which conveys freshwater from the Kern River to agricultural lands and groundwater recharge facilities.

The recharge basins at the Stockdale West property are dominated by intentionally planted safflower (*Carthamus tinctorius*). The recharge basins are separated by elevated roads with culverts installed underneath each road, allowing water to flow between the basins. Adjacent lands north and west of the property are comprised mainly of agricultural fields. The area adjacent to the southwest corner of the property is undisturbed native Saltbush (*Atriplex* ssp.) Scrub (Holland, 1986). A small area within the southwest portion of the western property boundary consists of non-native grassland (Holland, 1986). Directly south of the property is the Pioneer Canal and CVC, however a gap exists between the property and the canals that mostly consists of disturbed areas dominated by Russian thistle, but becomes the aforementioned undeveloped non-native grassland as it progresses west.

Soils and Topography

In general, the topography of the Stockdale East and West properties and the Central Intake is flat at approximately 310 feet above mean sea level (amsl). Soils on the project site are deep to very deep, well drained, with slow to moderately rapid permeability (NRCS, 2012). Soils on the project site generally consist of fine, sandy loams associated with agricultural uses when irrigated, and can support annual grasses and forbes when not actively irrigated. Descriptions of the four soil types found within the project site are discussed below.

Excelsior Series

Excelsior sandy loam is mapped as occurring within the project site. The Excelsior series consists of very deep, well-drained soils on alluvial fans and bars and channels on flood plains with slopes ranging from 0 to 2 percent. These soils allow negligible to medium runoff and moderate to slow permeability. The Excelsior series is used for irrigated cropland growing alfalfa, barley, cotton, and grapes; and for dairy and cattle production and building site development.

Granoso Series

Granoso loamy sand is mapped as occurring within the project site, along the alignment of the Central Intake. The Granoso series consists of very deep, somewhat excessively drained soils that formed in alluvium derived from rocks of mixed mineralogy. These soils typically occur on alluvial fans and floodplains with slopes from 0 to 5 percent. The Granoso series is used for irrigated crops such as cotton, alfalfa, dry beans, onions, carrots, lettuce, wheat, and pasture land.

Kimberlina Series

Kimberlina fine sandy loam, 0 to 2 percent slopes, and Kimberlina sandy loam, 2 to 5 percent slopes are mapped as occurring within the project site. The Kimberlina series consists of deep, well drained soils on flood plains and recent alluvial fans on slopes from 0 to 9 percent. These soils allow negligible to medium runoff, and moderately rapid and moderate permeability. The Kimberlina series is used for growing irrigated field, forage, and row crops. Some areas are also used for livestock grazing. When not irrigated, the soils support annual grasses, forbs, and *Atriplex* ssp. in the San Joaquin Valley.

Wasco Series

Wasco fine sandy loam and Wasco sandy loam are mapped as occurring within the project site. The Wasco series consists of very deep, well-drained soils on recent alluvial fans and flood plain on 0 to 5 percent slopes. These soils allow negligible or very low runoff, and moderately rapid permeability. The Wasco series is used for growing field, forage, and row crops. Some areas are used for livestock grazing, wildlife habitat, recreation, and residential sites. Native vegetation supported by this series includes *Atriplex* spp., annual grasses, and forbs.

Westhaven Series

Westhaven fine sandy loam is mapped as occurring within the project site. The Westhaven series consists of very deep, well drained soils that formed in stratified mixed alluvium weathered from sedimentary and/or igneous rocks, on 0 to 5 percent slopes. These soils allow low runoff and moderately slow permeability. The Westhaven series is used for irrigated cropland to grow wheat, lettuce, cotton, tomatoes, almonds, grapes, and peaches. Native vegetation supported by this series includes *Atriplex* spp., and annual grasses and forbs.

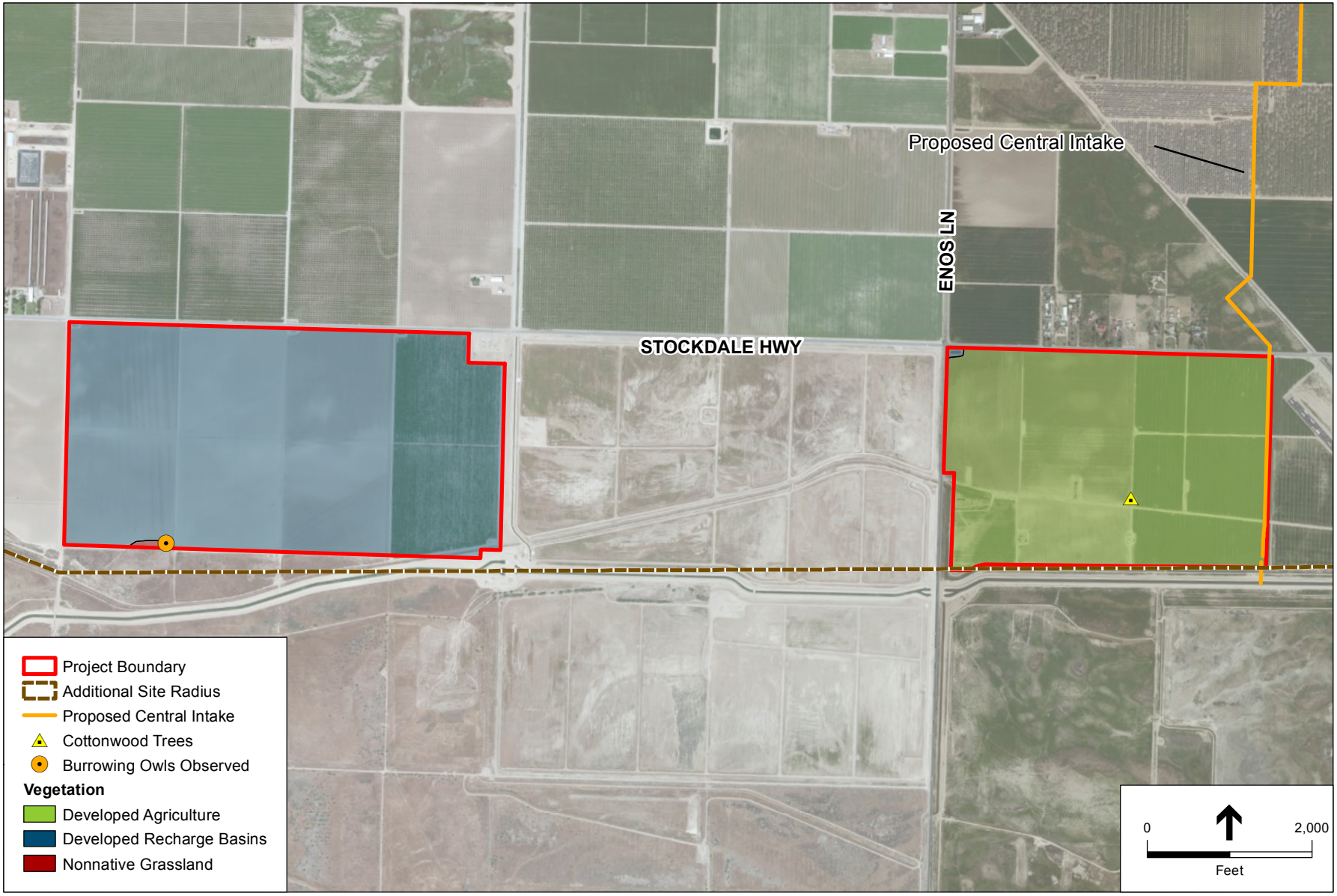
Vegetation Communities and Habitat Types

Vegetation communities are assemblages of plant species that occur together in the same area. Three distinct plant communities are found on the project site: Developed Agriculture, Developed Recharge Basins, and non-native grassland (Holland, 1986) (See **Figure 3.4-1**).

Developed Agriculture

Developed Agriculture is not a vegetation community defined by Holland (1986). However, the majority of the Stockdale East property, and the parcels surrounding both properties, including those to the north where the Central Intake alignment is located, are agricultural land supporting orchards, row crops, and fallow land. Crops found within this vegetation community include cotton, alfalfa, onions, safflower, almonds, carrots, and grapes divided by dirt access roads.

Several small areas of bare ground occur along the edges of the access roads where equipment and materials are being stored. Two cottonwood trees (*Populus fremontii*) and one unidentified ornamental tree occur in the southwestern portion of the Stockdale East property.



SOURCE: ESRI 2013

Stockdale Integrated Banking Project . 211181

Figure 3.4-1

Project Area Vegetation

The total area for Developed Agriculture within the project boundaries equates to approximately 230 acres on Stockdale East and 6.8 acres within the Central Intake alignment north of Stockdale East. This includes alfalfa, almonds, onions, squash, and fallow fields.

Developed Recharge Basins Land Cover

Developed Recharge Basin is not a vegetation community defined by Holland (1986). However, the majority of the Stockdale West property has been developed similar to neighboring Strand Ranch; it has been converted from agricultural fields into recharge basins planted with safflower. Raised access roads run between the basins with large culverts under each road to connect the basins. The culverts are reinforced with rip rap comprised of large rocks/boulders on both ends and around the road. There is also a small vegetated recharge basin in the northwest corner of the Stockdale East property.

The total area for Developed Recharge Basins within the project boundaries equates to approximately 323 acres on Stockdale West. This area is dominated by a monoculture of safflower but has weedy, ruderal species such as Russian thistle in areas that are disturbed along the basin and road edges.

Non-native Grassland (Holland Code 42200)

A small sliver of non-native grassland occurs near the southwestern edge of the Stockdale West property and was elevated slightly above the rest of the landscape and adjacent access road. This area had sparse vegetation dominated by Arabian schismus (*Schismus arabicus*). The total area for Nonnative Grassland within the project boundaries equates to approximately 0.91 acre.

Wildlife

Wildlife species observed at the project site are typical for the region. Nomenclature for wildlife species observed or expected to occur in the project area follow Jameson & Peeters (2004) for mammals, Jennings & Hayes (1994) and Stebbins (1985) for amphibians and reptiles, and Sibley (2003) for birds. Surveys conducted previously at Strand Ranch (ESA, 2008) identified many common wildlife species that would be expected to occur at the project site because of the close proximity and similar habitat types found there. These are discussed below.

No amphibians or reptiles were observed during the survey. Reptiles not observed but expected to be present include California kingsnake (*Lampropeltis getula californiae*), long-tailed brush lizard (*Urosaurus graciosus*), glossy snake (*Arizona* elegans), and western diamondback (*Crotalus* atrox). Though a vegetated recharge basin occurs in the northwest corner of Stockdale East, it is likely that this feature does not hold water perennially; therefore no suitable habitat for amphibians occurs and no amphibians were observed or are expected to occur at the project site.

Mammals observed include, California ground squirrel (*Spermophilus beechyi*), and desert cottontail (*Sylvilagus audubonii*). A potential San Joaquin kit fox (*Vulpes macrotis mutica*) burrow was found in the canal wall just south of Stockdale East during the 2012 survey. The burrow occurs where the north-south road that bisects Stockdale East intersects the canal on the southern border just outside of the project boundaries. Other mammals not observed but expected to be present include mule deer (*Odocoileus hemionus*), desert kit fox (*Vulpes macrotis*), Gray fox (*Urocyon cinereoargenteus*), bobcat (*Lynx rufus*), round-tailed ground squirrel (*Spermophilus*

tereticaudus), desert woodrat (*Neotoma lepida*), and other species of common mice and rats typical of the western Mojave Desert region.

The vegetation communities within the project site and immediate vicinity support a wide variety of resident, nesting, and migratory song birds typical of the region and habitat types present. The proposed project area also supports suitable foraging and hunting habitat for a number of raptors, including burrowing owl, red-tailed hawk (*Buteo jamaicensis*), and Swainson's hawk (*Buteo swainsoni*). Bird activity was low during the reconnaissance survey; observed avian species included burrowing owl and red-tailed hawk.

Jurisdictional Resources

The Stockdale East property abuts the Pioneer Canal on the southern boundary. The canal was dry during the reconnaissance survey. The canal consists of an unpaved channel comprised of dirt and sandy soils dominated by weedy plant species, such as Russian thistle. Its sandy berms provide habitat (breeding and foraging) for numerous local and migratory species of wildlife. Just south of the Pioneer Canal is the CVC; a paved canal with consistent, year-round water flow. There is also a small, shallow, vegetated recharge basin (0.5 acres) in the northwest corner of the Stockdale East property.

The Stockdale West property was recently converted from agricultural fields into recharge basins planted with safflower. Raised access roads run between the basins with large culverts under each road to connect the basins. The culverts are reinforced with rip rap comprised of large rocks and boulders on both ends and around the road, allowing water to flow between the basins. Directly south of the western property is the Pioneer Canal and CVC, however a gap exists between the property and the canals that mostly consists of a disturbed buffer area dominated by Russian thistle and non-native grassland.

The minimal hydrophytic vegetation within the onsite canals and water features are being maintained only by a man-made source of water and hydrology. Should these sources of water be terminated, the vegetation would no longer exist and, therefore the areas are not considered wetlands. The canals are man-made water supply conveyance facilities and thus are not considered waters of the U.S. or waters of the State. The shallow vegetated recharge basin on the Stockdale East property is used to store water for the adjacent agricultural fields. These three features are not under the jurisdiction of (or subject to regulation by) the United States Army Corps of Engineers (USACE) (per Section 404 of the Clean Water Act [CWA]), the California Department of Fish and Wildlife (CDFW) (per Section 1600 of the Fish and Game Code), or the Regional Water Quality Control Board (RWQCB) (per Section 401 of the CWA).

The Central Intake Pipeline would extend from the Goose Lake Slough south to the CVC. The pipeline would connect to the south levee of Goose Lake Slough, north of Brimhall Road, ending at an inlet structure that includes rip-rap for erosion protection. Goose Lake Slough may be considered waters of the U.S. and/or waters of the State since it is mapped as a blue-line stream on the Stevens USGS topographic quadrangle map and demonstrates upstream connectivity with the Kern River, a Relatively Permanent Water. However, the hydrology of the slough is completely controlled through a weir that diverts water from the Kern River; thus, the slough is

operated in a manner similar to other irrigation canals in the project area that are not considered jurisdictional features. The point at which it connects to the Kern River only has water intermittently. In the event that the slough falls under the jurisdiction of the USACE per Section 404 of the CWA, CDFW per Section 1600 of the Fish and Game Code, and/or the RWQCB per Section 401 of the CWA, permitting requirements may be required prior to construction of the proposed Central Intake Pipeline connection.

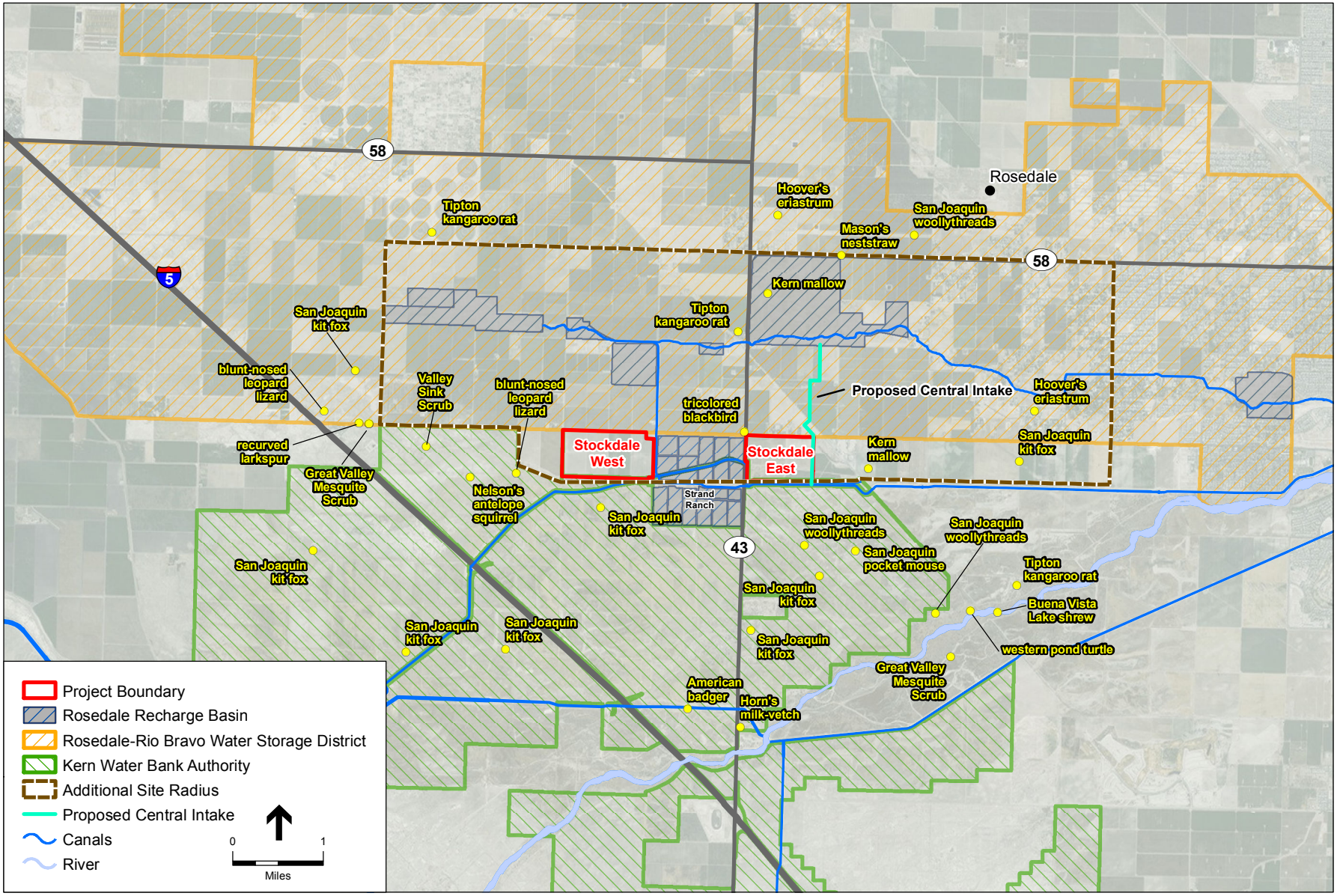
Special-Status Species and Natural Communities

Due to a general decline in population and habitat of certain species throughout California as a result of urbanization, agriculture, and industrial development, state and federal agencies, particularly the USFWS and CDFW, have listed a number of wildlife and plant species as threatened, endangered, or otherwise vulnerable to decline. Moreover, a number of state, federal, and local laws have been adopted to restrict and/or mitigate activities that could potentially impact a listed species or its habitat directly, indirectly, or cumulatively. Appendix D-1 provides tables describing each special-status wildlife and plant species and their potential to occur within the proposed project sites or vicinity, based on a 9-quadrangle radius, which includes 7.5-minute topographic quadrangles: Tupman, Buttonwillow, Rio Bravo, Rosedale, Stevens, Millux, Mouth of Kern, Taft, and East Elk Hills. The following sections focus on those species with a Medium to High Potential to occur within any of the proposed project areas or which have been confirmed to be Present on-site. Appendix D-1 also describes the Natural Communities of Special Concern within the nine quads listed above. **Figure 3.4-2** provides a more localized depiction of previously recorded species occurrence data per the CNDDB within a 3-mile radius of the proposed project areas.

Potential to occur was calculated based on the following criteria:

- **Low Potential:** The project site and/or immediate area only provide limited habitat for a particular species. In addition, the known range for a particular species may be outside of the immediate project area.
- **Medium Potential:** The project site and/or immediate area provide suitable habitat for a particular species, and proposed development may impact this species.
- **High Potential:** The project site and/or immediate area provide ideal habitat conditions for a particular species and/or known populations occur in the immediate area.
- **Present:** The species is know from the project site or was observed onsite during surveys.

The following is a brief description of the special-status wildlife species that are known to occur, or have a medium to high potential to occur on or in the vicinity of the proposed project site, and the status of their presence based on field surveys and documented references as discussed in Table 1 of Appendix D-1. For a more detailed description of each species refer to Appendix D-1.



SOURCE: ESRI 2013; CNDDB; Kern County GIS, 2012.

Stockdale Integrated Banking Project . 211181

Figure 3.4-2

CNDDB Records within 3 miles of Project Site

Reptiles

Blunt-Nosed Leopard Lizard

The blunt-nosed leopard lizard (*Gambelia sila)* is a federally endangered and state endangered/fully protected species. It is endemic to the San Joaquin Valley of central California. This species typically inhabits open, sparsely vegetated areas of low relief on the San Joaquin Valley floor and in the surrounding foothills. Holland (1986) described the vegetative communities that blunt-nosed leopard lizards are most commonly found in as non-native grassland and Valley Sink Scrub communities. Other suitable habitat types on the Valley floor for this species include Valley Needlegrass Grassland (Holland, 1986), Alkali Playa (Holland, 1986), and Atriplex Grassland (USFWS, 2010a). The blunt-nosed leopard lizard is considered to have a medium potential to occur on-site.

There is one CNDDB occurrence record for the species within the vicinity of the proposed project (CDFW, 2012a). Suitable habitat does occur on the proposed project sites within the non-native grassland and fallow agricultural fields, and many of the earthen berms along the access roads on Stockdale West contain many small mammal burrows that could be utilized by the species; however, the habitat on the proposed project sites is marginal at best and these areas are unlikely to support a population of the species. No blunt-nosed leopard lizards were observed on the project site during the 2012 reconnaissance surveys.

San Joaquin Whipsnake

The San Joaquin whipsnake (*Masticophis flagellum ruddocki)* is a California Species of Special Concern. The range of this species extends from west of Arbuckle in the Sacramento Valley southward to the Kern County portion of the San Joaquin Valley and westward into the inner South Coast Ranges. San Joaquin whipsnake habitat includes open dry valley grassland with little or no tree cover and sandy or rocky soils. It occurs in open terrain and is most abundant in grassland, desert scrub, chaparral, and pasture habitats. The San Joaquin whipsnake is considered to have a medium potential to occur on-site.

There are 5 occurrences of the species in the vicinity of the proposed project sites that are recorded to the CNDDB (CDFW, 2012a). Suitable habitat does occur on the proposed project site within the non-native grassland and fallow agricultural fields, and many of the earthen berms along the access roads on the Stockdale West property contain small mammal burrows that could be utilized by the species; however, the habitat on the proposed project sites is marginal at best and these areas are unlikely to support a population of the species. This species was not observed onsite during the reconnaissance-level survey in 2012.

Birds

Swainson's Hawk

The Swainson's hawk (*Buteo swainson*) is a state threatened species and protected by the federal Migratory Bird Treaty Act. They nest in strands with few trees in juniper-sage flats, riparian areas, and in oak savannahs. They require suitable adjacent foraging areas such as grasslands or alfalfa and grain fields which support rodent populations (PPA, 2006). Based on habitat requirements, the Swainson's hawk is considered to have a medium potential to occur on-site.

The species has been observed foraging in the vicinity of the proposed project. CDFW indicates there are known occurrence records documenting Swainson's hawk within 3.5 miles of the project site. The species generally forage within 10 miles of their nest tree. However, the species is unlikely to nest in the immediate vicinity of the proposed project sites due to the lack of suitable nesting substrate. Although two cottonwood trees exist on Stockdale East, no raptor nests were observed during the 2012 reconnaissance.

Burrowing Owl

Burrowing owl (*Athene cunicularia*) is a California Species of Special Concern. This small, ground-dwelling owl lives in ground squirrel and other mammal burrows that it appropriates and enlarges for its purposes. It typically is found in short-grass grasslands, open scrub habitats, and a variety of open, human-altered environments, such as golf courses, airport runways and agricultural fields. The burrowing owl is considered to be present on-site.

No focused burrowing owl surveys were conducted; however, the reconnaissance-level habitat assessment found that the project area contains suitable burrowing owl habitat within the non-native grassland, fallow agricultural fields, earthen berms that line the agricultural fields and access roads, and the adjacent Saltbush Scrub. Many of the earthen berms along the access roads on the Stockdale West property also contain small mammal burrows that could be utilized by the species in the future. Three burrowing owls were observed utilizing two separate burrows within the non-native grassland on the Stockdale West property during the reconnaissance (see Figure 3.4-1).

Tricolored Blackbird

The tricolored blackbird (*Agelaius tricolor*) prefers wetland and grassland habitats, although most native types of these habitats have been lost. Within the San Joaquin Valley, breeding colonies live mainly in the pasturelands, but can also be found in chaparral, orange and avocado groves, sagebrush grasslands, and salt-marsh habitat. Nesting takes place in native emergent marshes, grain fields, thickets of Himalayan blackberry, and other flooded and upland habitats (NatureServe, 2012a). The tricolored blackbird is considered to have a high potential to occur on-site.

The open water canals and agricultural fields on and near the proposed project sites can support this species. Tricolored blackbirds have been observed foraging in the region and a CNDDB occurrence record for the species is located adjacent to the Stockdale East property. No tricolored blackbirds were observed during the 2012 reconnaissance.

Mammals

Nelson's Antelope Squirrel

Nelson's antelope squirrel (*Ammospermophilus nelson*) is a state threatened species. It is a permanent resident of the western San Joaquin Valley from 60-360 meters in elevation on dry, sparsely vegetated, loam soils. It can be found from southern Merced County south to Kern, Kings, and Tulare Counties. The species also occurs in portions of eastern San Luis Obispo and Santa Barbara Counties. Suitable habitat has widely scattered alkali scrub vegetation and shrubs,

annual forbs and grasses, and is distributed over broken terrain with small gullies and dry washes with sandy loam soils (Zeiner *et al.*, 1988-1990). The Nelson's antelope squirrel is considered to have a medium potential to occur on-site.

Suitable habitat for the species exists on the proposed project sites within the non-native grassland and fallow agricultural fields, and many of the earthen berms along the access roads on the Stockdale West property contain many small mammal burrows that could be utilized by the species; however, the habitat on the proposed project site is marginal at best and these areas are unlikely to support a population of the species. Occurrence records for the species have also been recorded to the CNDDB within a mile of the proposed project site (CDFG, 2012a). No Nelson's antelope squirrels were observed during the 2012 survey.

Tipton Kangaroo Rat

The Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*) is a California and federally listed endangered species. Tipton kangaroo rats eat mostly seeds, with small amounts of green, herbaceous vegetation and insects supplementing their diet when available. Burrow systems are usually in open areas but may occur in areas of thick scrub. Current occurrences are limited to scattered, isolated areas. In the southern San Joaquin Valley this includes the Kern National Wildlife Refuge, Delano, and other scattered areas within Kern County. The Tipton kangaroo rat is considered to have a medium potential to occur on-site.

Suitable habitat for the species exists on the proposed project site in the non-native grassland and fallow agricultural fields, and many of the earthen berms along the access roads on the Stockdale West property contain many small mammal burrows that could be utilized by the species; however, the habitat on the proposed project site is marginal at best and these areas are unlikely to support a population of the species. An occurrence record for the species is documented in the CNDDB within one mile of the proposed project site (CDFW, 2012a). The Tipton kangaroo rat or kangaroo rat signs were not observed during the 2012 reconnaissance.

San Joaquin Kit Fox

The San Joaquin kit fox (*Vulpes macrotis mutica*) is a state threatened and federally listed endangered species. They feed primarily on ground squirrels, kangaroo rats, desert cottontails, mice, insects, carrion and ground-nesting birds. Their habitat includes the San Joaquin Valley and Kern County area (USFWS, 2010b). Based on such habitat requirements, San Joaquin kit fox is considered to have a high potential to occur on-site.

An occurrence record for the species is documented in the CNDDB within three miles of the proposed project sites (CDFW, 2012a). In addition, CDFW indicates there are known occurrence records of kit fox within the project vicinity (CDFW, 2013). No kit fox were observed during the 2012 reconnaissance; however, a potential kit fox burrow was found in the canal wall just south of the Stockdale East property during the 2012 survey. The burrow occurs where the north-south road that bisects the property intersects the canal on the southern border just outside of the boundaries of the proposed project site. No kit fox sign was observed at or near the burrow. Only one entrance to the burrow was observed so the potential for the den to be used for pupping is low; however, due to the species' known presence in the region and the existence of suitable

habitat in the immediate vicinity of the proposed project, there is a high probability that kit fox utilize the proposed project site.

The perimeter fencing installed on Stockdale West as part of the Stockdale West Ranch Pilot Project meets the criteria of CDFW and USFWS San Joaquin Kit Fox Minimization Measures (see **Appendix D-2**), which were implemented as part of the Pilot Project. The fencing allows for passage of kit fox by providing 8" x 12" openings near the ground every 100 yards along the solid wire mesh fence.

American Badger

The American badger (*Taxidea taxus*) is a California Species of Special Concern. The range of the American badger includes most of the State, with the exception of the northwestern forests. Badgers occupy a variety of habitats, including grasslands, savannas, and mountain meadows where soils are suitable for digging for their preferred prey, large rodents such as ground squirrels, gophers, and kangaroo rats (NatureServe, 2012b). The American badger is considered to have a high potential to occur on-site

Ideal habitat for this species exists on the proposed project sites and a potential active badger den has been observed in the immediate vicinity of the project sites. However, no badgers, badger sign or potential badger burrows were observed during the 2012 reconnaissance.

Special-Status Plant Species

Precipitation for 2011-2012 was typical in the project region as well as throughout most of the State (NOAA, 2012). Therefore, floristic representation at the time of the survey would have been typical for the month of July.

Based on the database search results, special-status plant species known to occur in the vicinity of the project site included 16 annual species, three perennial herbaceous, bulbiferous, or stem succulent species, and one moss.

Stockdale East and Stockdale West

Although none of the 16 annual special-status plant species identified in the database search would have likely been blooming during the July 2012 habitat assessment, all are considered to have a low potential for occurrence or are unlikely to occur on the proposed project site due to the lack of suitable habitat. Please refer to Table 2 of Appendix D-1 for a detailed description of each species and their potential to occur on the proposed properties.

No special-status plant species were found within the proposed project site and none are expected to occur based on the database search and habitat assessment.

Central Intake Pipeline

The Central Intake alignment extends north from the Stockdale East property to the Goose Lake Slough, occurring through similar habitat as the Stockdale East and West properties, consisting of disturbed and developed land associated with agricultural fields and recharge basins. The 16

annual special-status plant species identified in the database search have a low potential for occurrence or are unlikely to occur along the Central Intake alignment.

Third Stockdale Site

The exact location of the third Stockdale site is currently unknown. Based on the CNDDB occurrence data as depicted on Figure 3.4-2, the following is a brief description of the special-status plant species that are known to occur on or in the vicinity of the proposed third Stockdale site. For a more detailed description of each species refer to Appendix D-1.

Kern mallow (*Eremalche kemensis*) is a federally listed endangered species with a CNPS status of 1B.1.[2] This species is an annual herb with a flowering period between March and May. Kern mallow is found within chenopod scrub and valley and foothill grassland habitat.

Hoover's eriastrum (*Eriastrum hooveri*) has been federally de-listed and has a CNPS status of 4.2.[3] This species is an annual herb with a blooming period between March and July. Hoover's eriastrum prefers gravelly soils supporting chenopod scrub, pinyon and juniper woodland, and valley and foothill grasslands.

Natural Communities of Special Concern

Based on the database search, five natural communities of special concern can be found within the study area: Great Valley Cottonwood Riparian Forest, Great Valley Mesquite Scrub, Valley Sacaton Grassland, Valley Saltbush Scrub, and Valley Sink Scrub. However, none of these communities were found to be present within the proposed Stockdale West and Stockdale East properties, and the Central Intake alignment. As seen on Figure 3.4-2, there are no recorded occurrences of these communities within the additional site radius designated for the third Stockdale site.

Wildlife Movement Corridors

Habitat linkages provide a connection between two or more habitat areas that are often larger or superior in quality to the linkage. Such linkages can be quite small or constricted, but can be vital to the long-term health of connected habitats. Wildlife movement corridors are features that allow wildlife movement between patches of habitat, allowing for dispersal and genetic interchange. The Pioneer Canal and CVC to the south of the project areas, and Goose Lake Slough to the north of the Central Intake, provide opportunities for wildlife movement. In addition, the project area connects to an adjacent area of open space, the KWBA, along the southern borders of the properties, and thus linkage value is deemed high quality.

[2] CNPS Status: List 1B (Plants Rare, Threatened, Endangered in California and elsewhere), Threat rank: .1 (serious Endangered in California).
[3] CNPS Status: 4 (Plants of Limited Distribution – A Watch List), Threat Rank: .2 (fairly Endangered in California)

3.4.2 Regulatory Setting

Federal

Federal Endangered Species Act

Under the federal Endangered Species Act (FESA), the Secretary of the Interior and the Secretary of Commerce jointly have the authority to list a species as threatened or endangered (16 USC 1533(c)). Pursuant to the requirements of FESA, an agency reviewing a proposed project within its jurisdiction must determine whether any federally listed or proposed species may be present in the project region and determine whether the proposed project would have a potentially significant impact on such species. In addition, the agency is required to determine whether the project is likely to jeopardize the continued existence of any species proposed to be listed under FESA or result in the destruction or adverse modification of critical habitat proposed to be designated for such species (16 USC 1536(3), (4)). Project-related impacts to these species or their habitats would be considered "significant." Section 7 of FESA contains a "take" prohibition which prohibits any action conducted, funded, or approved by a federal agency that adversely affects a member of an endangered or threatened species without prior formal consultation with the USFWS. Formal consultation with the USFWS would result in the issuance of a Biological Opinion (BO) that includes either a jeopardy or non-jeopardy decision issued by the USFWS to the consulting federal agency. The BO would also include the possible issuance of an "incidental take" permit. If such authorization is given, the project proponent must provide the USFWS with a Habitat Conservation Plan (HCP) for the affected species and publish notification of the application for a permit in the Federal Register.

Section 4(a)(3) and (b)(2) of the FESA requires the designation of critical habitat to the maximum extent possible and prudent based on the best available scientific data and after considering the economic impacts of any designations. Critical habitat is defined in section 3(5)(A) of the FESA as (1) areas within the geographic range of a species that are occupied by individuals of that species and contain the primary constituent elements (physical and biological features) essential to the conservation of the species, thus warranting special management consideration or protection, and (2) areas outside of the geographic range of a species at the time of listing but that are considered essential to the conservation of the species.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA), first enacted in 1918, domestically implements a series of treaties between the United States and Great Britain (on behalf of Canada), Mexico, Japan, and the former Soviet Union that provide for international migratory bird protection. The MBTA authorizes the Secretary of the Interior to regulate the taking of migratory birds; the act provides that it shall be unlawful, except as permitted by regulations, "to pursue, take, or kill any migratory bird, or any part, nest or egg of any such bird…" (U.S. Code Title 16, Section 703). This prohibition includes both direct and indirect acts, although harassment and habitat modification are not included unless they result in direct loss of birds, nests, or eggs. The current list of species protected by the MBTA includes several hundred species and essentially includes all native birds. Permits for take of nongame migratory birds can be issued only for specific activities, such as

scientific collecting, rehabilitation, propagation, education, taxidermy, and protection of human health and safety and personal property.

Clean Water Act

Section 404 and Wetlands

In accordance with Section 404 of the federal CWA, the USACE regulates discharge of dredged or fill material into waters of the U.S. Waters of the U.S. and their lateral limits are defined in Title 33, Part 328.3(a) of the Code of Federal Regulations to include navigable waters of the United States, interstate waters, all other waters subject to the ebb and flow of the tide, and all other waters where the use or degradation or destruction of the waters could affect interstate or foreign commerce, tributaries to any of these waters, and wetlands that meet any of these criteria or that are adjacent to any of these waters or their tributaries.

Wetlands are a subset of "waters of the United States" and receive protection under Section 404 of the CWA. Wetlands are defined by the federal government (CFR, Section 328.3(b), 1991) as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Waters of the U.S. do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the CWA, the final authority regarding CWA jurisdiction remains with U.S. Environmental Protection Agency (EPA) (328.3(a)(8) added 58 FR 45035, August 25, 1993).

The USACE regulates the discharge of dredged or fill material into waters of the United States under Section 404 of the Clean Water Act. The jurisdictional delineation performed for the Stockdale East and Stockdale West study area determined that no USACE jurisdictional wetlands are present on or adjacent to these properties (see Appendix D). However, the Central Intake alignment is proposing to connect with the Goose Lake Slough, a potentially jurisdictional feature that may require regulatory permitting prior to construction.

Porter-Cologne Water Quality Control Act

Under the Porter-Cologne Water Quality Control Act, waters of the state fall under the jurisdiction of the appropriate RWQCB. Under the act, the RWQCB must prepare and periodically update water quality control basin plans. Each basin plan sets forth water quality standards for surface water and groundwater, as well as actions to control nonpoint and point sources of pollution to achieve and maintain these standards. Projects that affect wetlands or waters must meet waste discharge requirements of the RWQCB, which may be issued in addition to a water quality certification or waiver under Section 401 of the CWA. The RWQCB requires projects to avoid impacts to wetlands if feasible and requires that projects do not result in a net loss of wetland acreage or a net loss of wetland function and values. The RWQCB typically requires compensatory mitigation for impacts to wetlands and/or waters of the state. The RWQCB also has jurisdiction over waters deemed 'isolated' or not subject to Section 404 jurisdiction under *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*

(SWANCC).[4] Dredging, filling, or excavation of isolated waters constitutes a discharge of waste to waters of the state and prospective dischargers are required obtain authorization through an Order of Waste Discharge or waiver thereof from the RWQCB and comply with other requirements of Porter-Cologne Act.

State

CEQA Guidelines Section 15380

Although threatened and endangered species are protected by specific federal and state statutes, *CEQA Guidelines* Section 15380(b) provides that a species not listed on the federal or state list of protected species may be considered rare or endangered if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definition in FESA and the section of the California Fish and Game Code dealing with rare or endangered plants or animals. This section was included in CEQA primarily to deal with situations in which a public agency is reviewing a project that may have a significant effect on, for example, a candidate species that has not been listed by either USFWS or CDFW. Thus, CEQA provides an agency with the ability to protect a species from the potential impacts of a project until the respective government agencies have an opportunity to designate the species as protected, if warranted. CEQA also calls for the protection of other locally or regionally significant resources, including natural communities. Although natural communities do not at present have legal protection of any kind, CEQA calls for an assessment of whether any such resources would be affected, and requires findings of significance if there would be substantial losses. Natural communities listed by CNDDB as sensitive are considered by CDFW to be significant resources and fall under the *CEQA Guidelines* for addressing impacts. Local planning documents such as general plans often identify these resources as well.

California Endangered Species Act (CESA)

Under CESA, the CDFW is responsible for maintaining a list of threatened and endangered species (California Fish and Game Code 2007), candidate species, and species of special concern. Pursuant to the requirements of CESA, an agency reviewing a proposed project within its jurisdiction must determine whether any state listed endangered or threatened species may be present on the project region and determine whether the proposed project would have a potentially significant impact on such species. In addition, the CDFW encourages informal consultation on any proposed project that may impact a candidate species. If there were project-related impacts to species on the CESA threatened and endangered list, they would be considered "significant." Impacts to "species of concern" would be considered "significant" under certain circumstances, discussed below.

[4] Based on the Supreme Court ruling (SWANCC) concerning the Clean Water Act jurisdiction over isolated waters (January 9, 2001), non-navigable, isolated, intrastate waters based solely on the use of such waters by migratory birds are no longer defined as waters of the United States. Jurisdiction of non-navigable, isolated, intrastate waters may be possible if their use, degradation, or destruction could affect other waters of the Unites States, or interstate or foreign commerce. Jurisdiction over such other waters are analyzed on a case-by-case basis. Impoundments of waters, tributaries of waters, and wetlands adjacent to waters should be analyzed on analyzed on a case-by-case basis.

State Fish and Game Code

Section 2080 - Threatened and Endangered Species

Section 2080 of the State Fish and Game Code states, "No person shall import into this state [California], export out of this state, or take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the commission [State Fish and Game Commission] determines to be an endangered species or threatened species, or attempt any of those acts, except as otherwise provided in this chapter, or the Native Plant Protection Act, or the California Desert Native Plants Act." Pursuant to Section 2081 of the Code, the CDFW may authorize individuals or public agencies to import, export, take, or possess, any state-listed endangered, threatened, or candidate species. These otherwise prohibited acts may be authorized through permits or Memoranda of Understanding if: (1) the take is incidental to an otherwise lawful activity; (2) impacts of the authorized take are minimized and fully mitigated; (3) the permit is consistent with any regulations adopted pursuant to any recovery plan for the species; and (4) the applicant ensures adequate funding to implement the measures required by CDFW. The CDFW makes this determination based on available scientific information and considers the ability of the species to survive and reproduce. Due to the potential presence of state-listed rare, threatened, or endangered species on the project site, Sections 2080 and 2081 of the Code were considered in this evaluation.

Section 3503 – Nesting Birds and Raptors

Section 3503 of the California Fish and Game Code states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird. Section 3503.5 specifically states that it is unlawful to take, possess, or destroy any raptors (i.e., species in the orders Falconiformes and Strigiformes), including their nests or eggs. Typical violations of these codes include destruction of active nests resulting from removal of vegetation in which the nests are located. Violation of Section 3503.5 could also include failure of active raptor nests resulting from disturbance of nesting pairs by nearby project construction. This statute does not provide for the issuance of any type of incidental take permit.

Section 1600 – Lake and Streambed Alteration

CDFW regulates activities that would interfere with the natural flow of, or substantially alter, a channel, bed, or bank of a lake, river, or stream. These activities are regulated under the California Fish and Game Code Sections 1600-1616. Under Section 1602, it is unlawful for any person, governmental agency, or public utility to do the following without first notifying CDFW: substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. Requirements to protect the integrity of biological resources and water quality are often conditions of streambed alteration agreements. Requirements may include avoidance or minimization of the use of heavy equipment, limitations on work periods to avoid impacts on wildlife and fisheries resources, and measures to restore degraded sites or compensate for permanent habitat losses. A Streambed Alteration Agreement may be required by CDFW for construction activities that could result in an accidental release into a jurisdictional area.

A stream is defined as a body of water that flows at least periodically or intermittently through a bed or channel that has banks and supports fish or other aquatic life. This definition includes watercourses with a surface or subsurface flow that supports or has supported riparian vegetation. CDFW's jurisdiction within altered or artificial waterways is based on the value of those waterways to fish and wildlife. A CDFW streambed alteration agreement must be obtained for any project that would result in an impact on a river, stream, or lake.

Unlike the federal government, California has adopted the Cowardin, et al. (1979) definition of wetlands. For purposes of this classification, wetlands must have one or more of the following three attributes: (1) at least periodically, the land supports predominantly hydrophytes (at least 50 percent of the aerial vegetative cover); (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year.

Under normal circumstances, the federal definition of wetlands requires all three wetland identification parameters to be met, whereas the Cowardin definition requires the presence of at least one of these parameters. For this reason, identification of wetlands by state agencies consists of the union of all areas that are periodically inundated or saturated, or in which at least seasonal dominance by hydrophytes may be documented, or in which hydric soils are present.

Both state and federal wetland laws require that the biological and hydrological functions, which are lost when a wetland or water is altered or filled, be replaced as part of the respective permit processes. Compensatory actions include replacement of lost wetland acreage, usually in amounts substantially greater than the amount lost.

Sections 3511, 4700, 5050 and 5515 – Fully Protected Species

Protection of fully protected species is described in Sections 3511, 4700, 5050, and 5515 of the California Fish and Game Code. These statutes prohibit take or possession of fully protected species. CDFW is unable to authorize incidental take of fully protected species when activities are proposed in areas inhabited by those species. CDFW has informed nonfederal agencies and private parties that they must avoid take of any fully protected species in carrying out projects.

Native Plant Protection Act

The Native Plant Protection Act includes measures to preserve, protect, and enhance rare and endangered native plants. The list of native plants afforded protection pursuant to the Native Plant Protection Act includes those listed as rare and endangered under the CESA. The Native Plant Protection Act provides limitations on take as follows: "No person will import into this State, or take, possess, or sell within this State" any rare or endangered native plant, except in compliance with provisions of the act. Individual landowners are required to notify the CDFW at least 10 days in advance of changing land uses to allow the CDFW to salvage any rare or endangered native plant material. Due to the absence of state-listed rare, threatened, or endangered plant species on the project site, the Native Plant Protection Act was not considered in this evaluation.

Local

Metropolitan Bakersfield Habitat Conservation Plan

The Metropolitan Bakersfield Habitat Conservation Plan (MBHCP) addresses the effect of urban growth on federally and State protected plant and animal species within the Metropolitan Bakersfield 2010 General Plan area. The MBHCP is a joint program of the City of Bakersfield and Kern County that was undertaken to assist urban development applicants in complying with State and federal endangered species laws. The MBHCP utilizes a mitigation fee paid by applicants for local grading or building permits to fund the purchase and maintenance of habitat land to compensate for the effects of urban development on endangered species habitat. Half of the proposed project falls within the MBHCP area.

3.4.3 Impact Assessment

Thresholds of Significance

The following criteria from Appendix G of the *CEQA Guidelines* are used as thresholds of significance to determine the impacts of the proposed project as related to biological resources. The proposed project would have a significant impact if it would:

1. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.
2. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.
3. 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.
4. 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.
5. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
6. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan

Effects Found Not to be Significant

Threshold 4. Migratory Wildlife Corridors

The Pioneer Canal and CVC to the south of Stockdale East and Stockdale West, and Goose Lake Slough to the north of the Central Intake, provide opportunities for wildlife movement. In

addition, the project area connects to an adjacent area of open space along the southern borders of the properties, and thus linkage value is deemed high quality; however, the project is not anticipated to affect the continued movement of any fish or wildlife species in this agriculture-dominated landscape. Similarly, the third Stockdale site is not expected to conflict with wildlife migration corridors as it would be located within a similar area dominated by agriculture, and construction of the proposed project would not impede wildlife movement. No impact would occur, and no mitigation measures are required.

Threshold 5. Local Policies and Ordinances

No local policies or ordinances governing biological resources would be affected by the proposed project. No impact would occur and no mitigation measures are required.

Impacts and Mitigation Measures

Threshold 1. Sensitive and Special-Status Species

Impact BIO-1: Construction of the proposed project could result in adverse impact to special-status species.

Stockdale East, Stockdale West, and Central Intake Pipeline

Reptiles. Based on the conditions at Stockdale East, Stockdale West, and the Central Intake alignment, CNDDB records, and the 2012 reconnaissance survey, no suitable habitat exists for the blunt-nosed leopard lizard and the San Joaquin whipsnake; no impacts would occur, and no mitigation is required.

Birds. Activities associated with the construction of the proposed project on Stockdale East and Stockdale West and within the Central Intake alignment could result in adverse impacts to migratory birds protected under the MBTA and special-status bird species, including Swainson's hawk, burrowing owl and tricolored blackbird.

Direct impacts to migratory birds and special-status bird species, including raptors and the State Species of Special Concern tricolored blackbird, would involve the removal/disturbance of the non-native grassland, fallow and active agricultural fields, almond trees, and two cottonwood trees, which have the potential to provide nesting opportunities for resident birds. Removal of nesting habitat during the breeding season could result in the direct mortality of birds. Vegetation and tree removal, construction noise, vibrations, and human disturbance could cause nest abandonment, death of the young, or loss of reproductive potential at active nests located near proposed project activities. Implementation of **Mitigation Measure BIO-1** would reduce potential impacts to special-status nesting and migratory birds to less than significant levels.

The State threatened Swainson's hawk has been observed foraging in the vicinity of Stockdale East, Stockdale West, and the Central Intake alignment. The project sites provide potential foraging habitat for this species. Foraging habitat includes grasslands or alfalfa and grain fields that support rodent populations. The Stockdale East property would continue to be used for agricultural activities when not used for recharge and thus development of aboveground facilities at this site (e.g., recharge basins, well housing, pump station) would not preclude the use of the

site for foraging. At Stockdale West, development of three new wells with aboveground well housing would occupy a small portion of the site and allow for continue use of the site for foraging when not used for recharge, similar to existing conditions. The Central Intake alignment would temporarily affect the edges of neighboring alfalfa fields but would not result in permanent loss of foraging habitat. Although the potential for Swainson's hawk to nest in the immediate vicinity of the project sites is low, the species generally forage within 10 miles of their nest tree. In accordance with CDFW recommendations (CDFW, 2013), to avoid impacts to the species, preconstruction surveys would be conducted as described in **Mitigation Measure BIO-2**, with additional measures implemented to avoid disturbance in the event the species is detected. With implementation of **Mitigation Measure BIO-2**, any impacts to Swainson's hawk would be less than significant.

Burrowing owls and/or suitable burrowing owl habitat was observed at both Stockdale East and Stockdale West properties. Potential suitable habitat may exist in the agricultural fields along the Central Intake alignment. As a State Species of Special Concern, displacement of burrowing owls would be considered a significant impact. Burrowing Owl Surveys would be required prior to project implementation and would be conducted according to the *Staff Report on Burrowing Owl Mitigation* prepared by CDFW (2012). With implementation of **Mitigation Measure BIO-3**, any impacts to the burrowing owl would be less than significant.

Mammals. Based on the conditions at the Stockdale East and Stockdale West properties and along the Central Intake alignment, CNDDB records, and the 2012 reconnaissance, no suitable habitat exists for the Nelson's Antelope squirrel and Tipton kangaroo rat. Therefore, no impact to these species is expected and no mitigation is required. While the sites contains ideal habitat for badger, no sign was found; the species is highly mobile and therefore it is not likely that the species would be impacted. No mitigation is required.

Activities associated with the construction of the proposed project on Stockdale East could result in adverse impacts to the San Joaquin kit fox. A potential San Joaquin kit fox burrow was found in the canal wall just south of Stockdale East during the 2012 reconnaissance survey. In addition, there are known occurrences of kit fox within three miles of the project sites. Thus, there is potential for project construction at Stockdale East, Stockdale West, and along the Central Intake alignment to affect San Joaquin kit fox. Any impact to this State threatened and federally endangered species on any of the Stockdale Properties would be significant. With implementation of **Mitigation Measure BIO-4,** potential impacts to the San Joaquin kit fox would be reduced to a less than significant level. Mitigation Measure BIO-4 requires the USFWS "early evaluation" be completed in accordance with its most recent *San Joaquin Kit Fox Survey Protocol*, and, if necessary, subsequent surveys and consultation with CDFW and USFWS to determine measures for avoidance, minimization, restoration, preservation, or compensation.

Plants. No special-status plant species are known to occur or could potentially occur at the Stockdale East or Stockdale West properties, or along the Central Intake alignment. There is potential for special-status plant species to be present within the area of disturbance at Goose Lake Slough. Implementation of **Mitigation Measure BIO-5** will identify any special-status

plants that occur within the area of disturbance at the slough, and if necessary require implementation of avoidance measures, or if avoidance is not feasible then implementation of a Revegetation/Restoration Mitigation Plan.

Third Stockdale Site

Wildlife. The location of the third Stockdale site has not yet been determined. Once locations have been confirmed and finalized, respectively, pre-construction surveys would be required to determine suitability for special-status species to occur on-site. The overall composition of the area designated within the additional site radius is mainly composed of agricultural lands similar to the ones proposed for the Stockdale East and Stockdale West properties. It is assumed that similar impacts and species would occur at most potential sites within the additional site radius. Figure 3.4-2 shows existing point data occurrences of species recorded within the CNDDB for the area and Figure 3.4-1 shows an aerial view of the area which clearly demonstrates a majority of the area is dominated by agricultural land. **Mitigation Measures BIO-6** and **BIO-1** through **BIO-4** would reduce potential impacts to special-status wildlife species to a less than significant level.

Plants. Special-status plant species have the potential to occur within the proposed site radius for the third Stockdale site. Once the exact location of the third Stockdale site has been determined, pre-construction surveys, per **Mitigation Measure BIO-5**, would be required to determine the presence of special-status plant species and required steps to avoid or mitigate for impacts to such species.

Significance Conclusion

Less than Significant with Mitigation.

Mitigation Measures

BIO-1: The following measures would reduce potential impacts to nesting and migratory birds and raptors to less than significant levels:

- Within 15 days of site clearing, a qualified biologist shall conduct a preconstruction, migratory bird and raptor nesting survey. The biologist must be qualified to determine the status and stage of nesting by migratory birds and all locally breeding raptor species without causing intrusive disturbance. This survey shall include species protected under the Migratory Bird Treaty Act including the tricolored blackbird. The survey shall cover all reasonably potential nesting locations for the relevant species on or closely adjacent to the proposed project site.
- Nesting habitat should be removed prior to the bird breeding season (February 1 – September 30).
- If an active nest is confirmed by the biologist, no construction activities shall occur within 250 feet of the nesting site for migratory birds and within 500 feet of the nesting site for raptors. The buffer zones around any nest within which project-related construction activities would be avoided can be reduced as determined acceptable by a qualified biologist. Construction activities may resume once the breeding season ends (February 1 – September 30), or the nest has either failed or the birds have fledged.

BIO-2: If construction activities are scheduled to take place outside of the Swainson's hawk nesting season (which runs from March 1 – September 15), then no preconstruction clearance surveys or subsequent avoidance buffers are required. If construction activities are initiated within the nesting season then preconstruction nesting surveys shall be conducted by a qualified biologist prior to ground disturbance, in accordance with the guidance provided in the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Technical Advisory Committee, 2000). The required windshield surveys shall cover a one-half mile radius around the project sites. If a nest site is found, the qualified biologist shall determine the appropriate buffer zone around the nest within which project-related construction activities would be avoided. In addition, the qualified biologist shall consult with Rosedale and/or IRWD to determine whether consultation with CDFW is necessary.

BIO-3: A pre-construction survey shall be conducted for burrowing owls 14 to 30 days prior to clearing of the site by a qualified biologist in accordance with the most recent CDFW protocol, currently the *Staff Report on Burrowing Owl Mitigation* (CDFW 2012). Surveys shall cover suitable burrowing owl habitat disturbed by construction including a 500-foot buffer. The survey would identify adult and juvenile burrowing owls and signs of burrowing owl occupation. This survey shall include two early morning surveys and two evening surveys to ensure that all owl pairs have been located. If occupied burrowing owl habitat is detected on the proposed project site, measures to avoid, minimize, or mitigate impacts shall be incorporated into the proposed project and shall include, but not be limited to, the following:

- If owls are identified on or adjacent to the site, a qualified biologist shall provide a pre-construction Worker's Environmental Awareness Program to contractors and their employees that describes the life history and species protection measures that are in effect to avoid impacts to burrowing owls. Construction monitoring will also occur throughout the duration of ground-disturbing construction activities to ensure no impacts occur to burrowing owl.
- Construction exclusion areas shall be established around the occupied burrows in which no disturbance shall be allowed to occur while the burrows are occupied. Buffer areas shall be determined by a qualified biologist based on the recommendations outlined in the most recent *Staff Report on Burrowing Owl Mitigation* (CDFW 2012).
- If occupied burrows cannot be avoided, a qualified biologist shall develop and implement a Burrowing Owl Management Plan. The biologist shall develop the Plan in consultation with Rosedale and/or IRWD and shall coordinate with CDFW as necessary.

BIO-4: IRWD and Rosedale shall conduct a USFWS-approved "early evaluation" of the project area to determine if the project sites represent San Joaquin kit fox habitat. If the evaluation shows that the San Joaquin kit fox does not utilize the project sites, and the project will not result in take, then no further mitigation shall be required for this endangered species. If the "early evaluation" finds potential for the presence of kit fox, USFWS may require a San Joaquin kit fox survey to be conducted by a qualified biologist, in accordance with the most

recent USFWS *San Joaquin Kit Fox Survey Protocol*. If it is determined that the San Joaquin kit fox has the potential to utilize the property then the following measures are required to avoid potential adverse effects to this species:

- Rosedale and/or IRWD shall initiate discussions with the USFWS to determine appropriate project modifications to protect kit fox, including avoidance, minimization, restoration, preservation, or compensation.
- If evidence of active or potentially active San Joaquin kit fox dens is found within the area to be impacted by the proposed project, compensation for the habitat loss shall be determined and provided in consultation with USFWS and CDFW.

BIO-5: Prior to ground disturbing activities at the Goose Lake Slough and third Stockdale site, a qualified biologist shall conduct a pre-construction floristic survey and, if deemed necessary, focused rare plant survey of project areas to determine and map the location and extent of special-status plant species populations and natural communities of special concern within disturbance areas. Focused rare plant surveys shall occur during the typical blooming periods of special-status plants with the potential to occur. The plant surveys shall follow the CDFW Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (November 24, 2009).

If a special-status plant species is found to be present, and avoidance of the species and/or habitat is not feasible, the implementing agency shall retain a qualified botanist to prepare and implement a Revegetation/Restoration Mitigation Plan.

BIO-6: Prior to ground disturbing activities at the third Stockdale site, a habitat assessment shall be conducted by a qualified biologist to determine the potential for special-status wildlife species to occur within affected areas. If the habitat assessment determines that a special-status species has the potential to be present within a minimum of 500 feet of the construction zone, a qualified biologist shall determine whether subsequent focused surveys are required prior to project implementation to determine presence or absence.

If a special-status wildlife species is found to be present, and avoidance of the species and/or habitat is not feasible, then Mitigation Measures BIO-1 through BIO-4 shall be implemented as appropriate, or Rosedale and/or IRWD shall consult with a qualified biologist to prepare a species-specific mitigation plan and determine whether consultation with wildlife agencies are recommended.

Threshold 2. Sensitive Natural Communities

Impact BIO-2: The proposed project could have a substantial adverse effect on sensitive natural communities.

Stockdale East, Stockdale West, and Central Intake Pipeline

No sensitive natural communities were found within the Stockdale East or Stockdale West properties during the 2012 reconnaissance. In addition, no sensitive natural communities exist

along the Central Intake alignment. No impact would occur, and no mitigation is required for those properties.

Third Stockdale Site

There are no previously recorded sensitive natural communities within the additional site radius where the third Stockdale site would be located (see Figure 3.4-2). In addition, due to the composition of the surrounding areas being mainly agricultural land, it is unlikely that any sensitive natural communities would be present within the potential third Stockdale site. However, once the properties have been confirmed/selected, pre-construction surveys of the area as described in **Mitigation Measure BIO-5** would be required, which would identify any sensitive natural communities and ensure that potential impacts are reduced to a less than significant level.

Significance Conclusion

Less than Significant with Mitigation.

Mitigation Measures

Implement **Mitigation Measure BIO-5**.

Threshold 3. Wetlands

Impact BIO-3: The proposed project could have a substantial adverse effect on federally protected wetlands.

Stockdale East and Stockdale West

No waters of the U.S., waters of the State, or any other additional jurisdictional riparian habitat or wetlands occur in or around the Stockdale East or Stockdale West properties. The local canals (e.g., CVC and Pioneer Canal) are man-made water supply conveyance facilities and thus are not considered waters of the U.S. or waters of the state. There would be no impact to jurisdictional features such as wetlands.

Central Intake Pipeline

Goose Lake Slough may be considered waters of the U.S. and/or waters of the State since it demonstrates upstream connectivity with the Kern River, a Relatively Permanent Water. However, the hydrology of the slough is completely controlled through a weir that diverts water from the Kern River; thus, the slough is operated in a manner similar to other irrigation canals in and surrounding the project area that are not considered jurisdictional features. Connecting the Central Intake Pipeline to the Goose Lake Slough may result in potential impacts to a potentially jurisdictional feature, depending on the methods and degree of impact during construction.

Implementation of **Mitigation Measure BIO-7** would reduce potential impacts to a less than significant level by requiring preparation of a jurisdictional delineation, and if jurisdictional features are identified, that requires mitigation and compensation requirements to be implemented prior to construction. If wetlands are present on-site, the implementing agency would be required

to obtain a Section 404 Permit from the USACE or written documentation that one is not required.

Third Stockdale Site

Once the location of the third Stockdale site has been determined, a jurisdictional delineation of the area may be required to determine the presence of wetlands, riparian habitat, or jurisdictional waters. Implementation of **Mitigation Measure BIO-7** would reduce potential impacts to a less than significant level by requiring preparation of a jurisdictional delineation, and if jurisdictional features are identified, that requires mitigation and compensation requirements to be implemented prior to construction. If wetlands are present on-site, the implementing agency would be required to obtain a Section 404 Permit from the USACE or written documentation that one is not required.

Significance Conclusion

Less than Significant with Mitigation.

Mitigation Measures

BIO-7: For project components that have potential to impact jurisdictional features, prior to ground disturbing activities, a qualified biologist shall be retained to conduct a jurisdictional delineation in areas that may be affected by the project. If jurisdictional resources are identified, the qualified biologist shall prepare a jurisdictional delineation report outlining the potential acreage of jurisdictional features that may be impacted. The jurisdictional delineation report will be submitted to USACE for a jurisdictional determination. If the delineation report determines that jurisdictional waters and/or wetlands are present within the project site, regulatory permits may be required prior to project impacts which include mitigation and/or compensation to reduce impacts to jurisdictional features to a less than significant level. Based on the results of the delineation report, permits required may include a 404 or Nationwide Permit from USACE, a 401 Certification from RWQCB and/or a Streambed Alteration Agreement from CDFW. Project impacts under 0.10 acre may not require a permit from USACE but only a notification of impact. The appropriate permits required to reduce impacts to jurisdictional features will be determined through initial consultation with the resource agencies.

Threshold 6. HCP and NCCP

Impact BIO-4: The proposed project could conflict with the Metropolitan Bakersfield Habitat Conservation Plan.

The Stockdale East property and the alignment for the Central Intake Pipeline fall within natural and agricultural lands in the MBHCP area. The third Stockdale site has not yet been determined, and could fall within the jurisdiction of the MBHCP as shown on Figure 3.10-3 in **Chapter 3.10, Land Use and Planning**. The MBHCP's primary focus is on lands converted to urban uses (MBHCP, 1994). The MBHCP sets forth a program for the preservation and protection of habitat for several rare or endangered species found in the HCP study area in exchange for the loss of some

existing habitat from urban development. The MBHCP permit only applies to City or County actions, or actions by others, which involve City or County permits. Special agencies, such as Rosedale, that are exempt from local permitting have other options with regard to endangered species issues, including resolving endangered species issues directly with USFWS and CDFW (MBHCP, 1994). Given that the proposed project would not result in the conversion of land to urban uses, and that mitigation measures have been included to reduce project impacts to threatened and endangered species to less than significant levels (Mitigation Measures BIO-1 though BIO-6), the proposed project would not conflict with the MBHCP. No mitigation is required.

Significance Conclusion

Less than Significant.

Mitigation Measures

None required.

References – Biological Resources

California Department of Fish and Wildlife (CDFW). 2007. *Fish and Game Code of California.*

CDFW. 2011. State of California Natural Resources Agency Department of Fish and Game Biogeographic Data Branch California Natural Diversity Database Special Animals List. January 2011. http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/spanimals.pdf Accessed: September 11, 2012.

CDFW. 2012a California Natural Diversity Database 3.1.0 Kern County and the following USGS 7.5-minute topographic quadrangles: Tupman, Buttonwillow, Rio Bravo, Rosedale, Stevens, Millux, Mouth of Kern, Taft, and East Elk Hills.

CDFW. 2012b. *Staff Report on Burrowing Owl Mitigation*. State of California Natural Resources Agency. March 7, 2012.

California Native Plant Society (CNPS). 2012. Inventory of Rare and Endangered Plants (online edition, v7-09b). California Native Plant Society. Sacramento, CA. Accessed on Tue, September 11, 2012 from http://www.cnps.org/inventory

Center for Biological Diversity. 2012. *Tricolored Blackbird Species Account: Natural History*. http://www.biologicaldiversity.org/species/birds/tricolored_blackbird/natural_history.html Website accessed September 12, 2012.

City of Bakersfield and Kern County. 2002. *Metropolitan Bakersfield General Plan Update EIR*, adopted June 26, 2002.

City of Bakersfield and Kern County, 1994. *Metropolitan Bakersfield Habitat Conservation Plan.* April 1994.

Code of Federal Regulations, as amended. Volume 33: Sections 325 through 328.

Environmental Science Associates (ESA). 2008. *Final Environmental Impact Report for the Strand Ranch Integrated Banking Project* . Prepared for Rosedale-Rio Bravo Water Storage District. May 2008.

Hickman, James C. ed. 1993. *The Jepson Manual*. University of California Press, Berkeley and Los Angeles, California.

Holland, Robert F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. California Department of Fish and Game, Natural Heritage Division, Sacramento, CA 1986.

Jameson, E.W. and Peeters, H.J. 2004. *Mammals of California*. University of California Press, Berkeley and Los Angeles, California.

Jennings, M. R., and M. P. Hayes. 1994. *Amphibian and reptiles species of special concern in California*. California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, California.

Jepson Flora Project, *Jepson Online Interchange*, http://ucjeps.berkeley.edu/interchange.html. Copyright@ Regents of the University of California, accessed September 9, 2012.

National Oceanic and Atmospheric Administration (NOAA). 2012. National Weather Service online records for precipitation December 2011 – July 2012: http://www.weather.gov/ (Accessed: September 13, 2012).

NatureServe. 2012a. NatureServe Explorer: An online encyclopedia of life [Tricolored blackbird]. Version 7.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: September 12, 2012)

NatureServe. 2012b. NatureServe Explorer: An online encyclopedia of life [American Badger]. Version 7.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: September 12, 2012)

Paul Pruett and Associates (PPA), Biota Report 628 Acres ±, Sec 2, T30S, R25E, MDBM SW Cor, Enos Lane and Stockdale Highway, Kern County, California, prepared for Alliance Appraisal Company, Bakersfield, California, 2003.

Paul Pruett and Associates (PPA), Biota Report 18+ Acres; 2,640 Feet Canal Turnout, Section 02, T30S, R25E, MDB&M, Bakersfield, California, prepared for Westmark Group, LLC, Bakersfield, California, October 2006.

Ram Environmental, 2009. *Phase I Environmental Site Assessment, APN#'S 160-010-39, and 42, Bakersfield, CA*, December 2009.

Sawyer, John O. and Keeler-Wolf, Todd. 2009. *A Manual of California Vegetation, 2nd Edition.* California Native Plant Society. United Sates of America.

Sibley, D. 2003. *The Sibley Field Guide to Birds of Western North America*. Alfred A. Knopf, New York.

Stebbens, Robert. 1985. *Western Reptiles and Amphibians.* Houghton Mifflin Company, New York.

U.S. Army Corps of Engineers 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)

U.S. Department of Agriculture (USDA), National Resources Conservation Service (NRCS), 2012. *Web Soil Survey*, data request for IRWD Stockdale West Joint Banking Project site, web application available at: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx , accessed July 2012.

U.S. Fish and Wildlife Service (USFWS) and CDFW. 1996. Survey Protocol for the Morro Bay Kangaroo Rat: www.dfg.ca.gov/hcpb/species/stds_gdl/survmonitr.shtml. Accessed on September 12, 2012.

United States Fish and Wildlife Service (USFWS). 1999. *San Joaquin Kit Fox Survey Protocol for the Northern Range*. Prepared by the Sacramento Fish and Wildlife Office, June 1999.

USFWS, 2010a. *Blunt-nosed leopard lizard (*Gambelia sila*) 5-Year Review: Summary and Evaluation*. February 2010.

USFWS, 2010b. *San Joaquin Kit Fox (*Vulpes macrotis mutica*) 5-Year Review: Summary and Evaluation*. February 16, 2010.

USFWS, 2011. *Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance*. Prepared by the Sacramento Fish and Wildlife Office. January 2011.

USFWS, 2012a. Federal Endangered and Threatened Species that may be Affected by Projects in Kern County.

USFWS, 2012b. *United States Fish and Wildlife Service National Wetlands Inventory online wetlands mapper*. http://www.fws.gov/wetlands/Data/Mapper.html. Last updated: September 6, 2012. Accessed September 11, 2012.

Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White, eds. 1988-1990. California's Wildlife. Vol. I-III. California Department of Fish and Game, Sacramento, California.

3.5 Cultural Resources

This chapter addresses the potential impacts of the proposed project to cultural resources in the project vicinity in accordance with the significance criteria established in Appendix G of the *CEQA Guidelines.* This chapter is based on the report *IRWD Stockdale West Ranch Joint Banking Project Phase I Cultural Resources Study* (Ehringer et al., 2013) and *Stockdale Integrated Banking Project – Addendum to IRWD Stockdale West Ranch Joint Banking Project: Phase I Cultural Resources Study* (Ehringer and Gonzalez, 2015).

Cultural resources are defined as prehistoric and historic sites, structures, districts, and landscapes, or any other physical evidence associated with human activity considered important to a culture, a subculture, or a community for scientific, traditional, religious or any other reason. Under CEQA, paleontological resources, although not associated with past human activity, are grouped within cultural resources. For the purposes of this analysis, cultural resources may be categorized into four groups: archaeological resources, historic resources, including architectural/engineering resources, contemporary Native American resources, and paleontological resources.

Archaeological resources are places where human activity has measurably altered the earth or left deposits of physical remains. Archaeological resources may be either prehistoric-era (before European contact) or historic-era (after European contact). The majority of such places in California are associated with either Native American or Euro-American occupation of the area. The most frequently encountered prehistoric or historic Native American archaeological sites are village settlements with residential areas and sometimes cemeteries; temporary camps where food and raw materials were collected; smaller, briefly occupied sites where tools were manufactured or repaired; and special-use areas like caves, rock shelters, and rock art sites. Historic-era archeological sites may include foundations or features such as privies, corrals, and trash dumps.

Historic resources include standing structures, infrastructure, and landscapes of historic or aesthetic significance that are generally 50 years of age or older. In California, historic resources considered for protection tend to focus on architectural sites dating from the Spanish Period (1529-1822) through World War II (WWII). Some resources, however, may have achieved significance within the past 50 years if they meet the criteria for exceptional significance. Historic resources are often associated with archaeological deposits of the same age.

Contemporary Native American resources, also called ethnographic resources, can include archaeological resources, rock art, and the prominent topographical areas, features, habitats, plants, animals, and minerals that contemporary Native Americans value and consider essential for the preservation of their traditional values. These locations are sometimes hard to define and traditional culture often prohibits Native Americans from sharing these locations with the public.

Paleontology is a branch of geology that studies the life forms of the past, especially prehistoric life forms, through the study of plant and animal fossils. Paleontological resources represent a limited, non-renewable, and impact-sensitive scientific and educational resource. As defined in this section, paleontological resources are the fossilized remains or traces of multi-cellular

invertebrate and vertebrate animals and multi-cellular plants, including their imprints from a previous geologic period. Fossil remains such as bones, teeth, shells, and leaves are found in the geologic deposits (rock formations) where they were originally buried. Paleontological resources include not only the actual fossil remains, but also the collecting localities, and the geologic formations containing those localities.

3.5.1 Environmental Setting

Natural Setting

The proposed project is located in the southern San Joaquin Valley, within California's Central Valley, which extends from the Siskiyou Mountains in the north to the Tehachapi Mountains in the south and covers an area 450 miles long and 250 miles wide. The Central Valley is bound by the Cascade Ranges and Sierra Nevada Mountains in the east and the Coast Ranges in the west.

Historically, the valley supported a treeless plain with patches of alkali-tolerant annual forbs and grasses (Fagan, 2003; Rosenthal et al., 2007). Dominant vegetation in the wetlands consisted of large growths of tules. In drier spots, sage, greasewood, and bunchgrass flourished. Trees, such as cottonwoods, sycamores, and willows, lined river channels and sloughs, but were absent from the valley floor (Wallace, 1978). The wetlands supported a huge number of aquatic fowl, including migratory ducks and geese, abundant fish, turtles, and freshwater mussels. Antelope, deer, and elk wintered on the plains. Other wildlife included jackrabbits, ground squirrels, and quail (Wallace, 1978).

The proposed project is approximately 2.5 to 3 miles north of the main channel of the Kern River, which naturally carries snowmelt south through Bakersfield out of the Sierra Nevada. Due largely to the negligible gradient across the valley floor, in the past, water from the Kern River tended to exhibit a distributary pattern at lower elevations, splitting into smaller channels (ECORP, 2007). These distributaries created a network of sloughs (Goose Lake Slough, Buena Vista Lake Slough), streams, marshes, and shallow lakes. Water tended to collect in Goose Lake, Kern Lake, and Buena Vista Lake, the last being the most seasonally stable. During overflow conditions, water flowed from Kern and Buena Vista Lakes along Buena Vista Slough towards Tulare Lake (ECORP, 2007). The environment of the sloughs and surrounding areas would have been intermittently to seasonally inundated, creating marshy/swampy conditions that would have provided important resources, such as tules, cat-tail, and sedges, as well as animal habitat. Diversion of the Kern and channelization (canalization) of distributary streams and sloughs since the end of the 19th century, as well as construction of Lake Isabella Dam in 1953, has significantly altered the hydrology and natural setting of the project area, resulting in more arid conditions than would have existed at certain times prehistorically.

The southern San Joaquin Valley is characterized by a surface geology consisting of young (Holocene-age) alluvium and flood basin deposits (DWR, 2003). These consist of interstratified and discontinuous beds of clay, silt, sand, and gravel, and are approximately 150 feet thick at the margins of the valley. These younger deposits overlie older alluvium.

Prehistoric Setting

The Central Valley prehistoric record is divided into three basic periods: Paleo-Indian (11,550 to 8550 cal B.C.), Archaic (8550 cal B.C. to cal A.D. 1100), and Emergent (cal A.D. 1100 to Historic). The Archaic period is subdivided into three sub-periods: Lower Archaic (8550 to 5550 cal B.C.), Middle Archaic (5550 to 550 cal B.C.), and Upper Archaic (550 cal B.C. to cal A.D. 1100) (Rosenthal et al., 2007).

Evidence of human occupation of the Central Valley during the Paleo-Indian period comes primarily from the San Joaquin Valley. Basally thinned and fluted projectile points dating to between 11,550 and 9550 cal B.C. have been found in three San Joaquin Valley localities: Tracy Lake, the Woolfsen mound, and the Tulare Lake basin.

Lower Archaic occupation of the Central Valley is known mainly from isolated finds located along the ancient shorelines of lakes. One archaeological site dating to the Lower Archaic has been identified in the Central Valley floor. Site CA-KER-116, located on the ancient shoreline of Buena Vista Lake in the southern San Joaquin Valley, dates between 7175 and 6450 cal B.C. based on radiocarbon dates obtained from freshwater mussels (Rosenthal et al., 2007). The degree of variation and interaction between valley floor and foothill groups is presently unknown. In fact, Lower Archaic sites from foothill and valley sites may not represent divergent adaptations, but may instead be seasonal expressions of the same group (Rosenthal et al., 2007).

By the Middle Archaic, foothill and valley floor groups were distinct and separate adaptations. Subsistence patterns of the late Middle Archaic reflect an increasing exploitation of river corridors in the Sacramento and San Joaquin Valleys. Sites were occupied year-round and technological assemblages suggest a growing reliance on fishing. Gorge hooks, composite bone hooks, and spears all appear in the archaeological record during the late Middle Archaic. Tule elk, mule deer, pronghorn sheep, rabbits, and waterfowl are also represented in faunal assemblages and indicate exploitation of freshwater marshes, riparian forests and grasslands.

Regional trade was widespread during the Middle Archaic. Obsidian, shell beads and ornaments are commonly recovered from sites. The earliest appearance of grooved-rectangle beads is in the southern San Joaquin valley and generally date to 3050 cal B.C or earlier (Rosenthal et al., 2007).

The start of the Upper Archaic roughly coincides with climactic changes during the Late Holocene. These changes resulted in a cooler, wetter, more stable environment. Freshwater flow increased in the Sacramento/San Joaquin watershed at this time. During the Upper Archaic, regional variations were more common and focused on resources which could be processed in bulk, such as acorns, salmon, shellfish, rabbits, and deer. Shell bead trade and technological specialization increased. Polished and ground stone plummets, sometimes recovered as caches, are commonly recovered from riparian environments and marshlands in the delta and southern San Joaquin Valley. Use of mortars and pestles for food processing was prevalent, except for the valley margins where handstones and millingslabs remained dominant (Rosenthal et al., 2007).

While the archaeological record is well-known for most of the Central Valley during the Upper Archaic period, very little information is available for Upper Archaic traditions in the southern

San Joaquin Valley. Two known Upper Archaic deposits, at CA-KER-116 and CA-KER-39 on Buena Vista Lake, suggest year-round settlements as represented by house floors and significant food remains indicating resource exploitation of riverine, wetland, and terrestrial environments (Rosenthal et al, 2007).

During the Emergent Period (cal A.D. 1100 to Historic), many Archaic Period technologies and cultural traditions disappeared throughout the Central Valley. Practices very similar to those observed by later European explorers appeared at this time. The bow and arrow replaced the dart and atlatl in hunting. Manufacturing centers were decentralized. Raw materials, in the form of obsidian cobbles and shell bead blanks, were transported from their sources to areas where the finished product would be completed. Increasingly complex burial practices, as indicated by grave goods and variation in burial type, developed. Cremation became widespread during the Upper Emergent (Rosenthal et al., 2007).

Central Valley sites during this time period exhibit faunal assemblages characterized by large quantities of fish bone and a diversity of bird and mammal bones, with some regional variations. In the southern San Joaquin Valley, pottery was not manufactured but was obtained by trade with groups from the foothills. Cottonwood points are commonly found in the Tulare and Buena Vista basins (Rosenthal et al., 2007).

Ethnographic Setting

At the time of contact, the Central Valley was occupied by speakers of the California Penutian language family, specifically the Yokuts. The Yokuts entered the San Joaquin Valley sometime prior to A.D. 1400, perhaps by force. Cemeteries to the north contain skeletal remains with fatal wounds inflicted by projectile points. Historically, Yokuts have been divided into three cultural-geographical groupings: Northern Valley, Southern Valley, and Foothills. The Southern Valley Yokuts resided in the areas surrounding the proposed project at the time of contact, with populations concentrated around three lakes in the southern San Joaquin Valley: Tulare Lake, Buena Vista Lake, and Kern Lake (Arkush, 2003; Fagan, 2003).

Subsistence and raw materials were provided by local water resources. Abundant tule, growing in the marshes and along riverbeds, provided the Yokuts with natural materials to build reed canoes and basketry. Their diet consisted mainly of fish, waterfowl, shellfish, roots, and seeds. Preferred fish included lake trout and, when available, steelhead, salmon and sturgeon. Chub, perch, and suckers were less desirable and caught in smaller numbers. Fish were caught by trolling with nets, diving with hand nets, spearing, basketry traps, with bare hands, or with a bow and arrow. Available waterfowl included geese, ducks, and mud hens. Methods for capturing birds included snares, nets, bow and arrow, and throwing tule mats over their prey. Stuffed decoys were employed to assist in capture. The Yokuts also acquired eggs from nests (Wallace, 1978; Fagan, 2003).

Other foodstuffs included freshwater mussel, turtles, wild seeds and roots, which were all consumed in large quantities. Grassnut roots were roasted whole or made into a paste. The absence of oak trees in the valley floor meant that acorns, a staple of many other California Indian groups, were only available by trade. Land mammals comprised an insignificant percentage of the

Yokut diet. On occasion, wild pigeons, jackrabbits, ground squirrels, and burrowing rodents were acquired. Larger game, such as antelope and elk, were rarely hunted (Wallace, 1978).

Yokuts were uniquely egalitarian in their political organization. Local groups were self-governing and all members received equal ownership and access to most resources (Arkush, 2003). The Southern Valley Yokut groups maintained trade relationships with the Chumash, who lived to the southwest (Fagan, 2003).

Historic Setting

Spanish explorers first encountered the Southern Valley Yokuts in 1772 when a small contingent of soldiers, led by Pedro Fages, passed through the Tejon Pass and into the southern San Joaquin Valley. After a stop at a village on Buena Vista Lake, the party headed west toward San Luis Obispo. The area was visited again in 1776 by Francisco Garces. In 1806, Franciscans made a futile attempt to missionize the Southern Valley Yokuts. While a few members of some Southern Valley Yokut groups (such and the Tachi and Telamni) were absorbed into the mission system, the majority of Central Valley Native Americans avoided this fate (Wallace, 1978).

The Southern San Joaquin valley became, instead, a haven for runaway neophytes. These runaways introduced their own customs, as well as some learned from the Spanish, including a desire for horses. The Yokuts began to raid missions and ranchos and became known as the "Horsethief Indians" (Wallace, 1978). After Mexico won its independence from Spain, Mexican rancheros began to retaliate, trying to recover their lost livestock. Their efforts included punishing and enslaving the Yokut raiders. An epidemic in 1833 decimated the Southern Valley Yokuts, killing roughly 75 percent of the population.

Other intrusions in the Central Valley included American and British-Canadian fur trappers, who entered the valley as early as 1827, and John C. Fremont, who conducted scientific expeditions into the southern San Joaquin Valley in 1844 and 1845 (JRP Historical Consulting, 2009). However, sustained contact with Europeans did not occur until after 1850, when California became part of the United States. The remaining population of Yokuts gave up rights to their lands in exchange for goods in an 1851 treaty with the United States government. The Southern Valley Yokuts were subsequently moved onto either the Tejon or Fresno reservations (Wallace, 1978).

Early American interest in southwestern Kern County focused on its use as a transportation corridor. In 1854, Fort Tejon was established to protect strategic mountain routes between the San Joaquin Valley and Southern California (Kyle, 1990). Many Euro-Americans traveled from the south to the gold country to the north by way of the Central Valley. The Central Valley was also used for cattle ranching and agriculture. The wetlands of the Valley were reclaimed and irrigation canals built to facilitate agriculture.

Water Conveyance

The proposed project is located in an area of Kern County which has historically been exploited for its natural resources, including petroleum. The area was also at the center of one of the

defining moments in the history of United States water rights, and the conveyance and use of water for irrigation has been a dominant theme in local history.

Miller and Lux

Henry Miller and Charles Lux, both German immigrants, came to the area in the 1850s. The pair went into business together, becoming extremely successful cattle ranchers and some of the largest landowners in the United States. By 1879 Miller and Lux owned 78,908 acres along the Buena Vista Slough (Igler, 2001).

In an attempt to reclaim the swampland of the Buena Vista Slough, Miller and Lux formed the Kern Valley Water Company and built a system of drainage, irrigation, and flood control canals. Once the waters of the Kern River were diverted, the former slough would be available for cultivation. A main flood control canal, the Kern Valley Water Company Canal, was built along the west side of the swamp, extending 26 miles north from Buena Vista Lake (Morgan, 1914). Following this, sometime prior to the 1890s, the East Side and West Side canals were constructed for the distribution of water.

In 1879, Miller and Lux sued the rival Kern Land Company to prevent the consumption of the Kern River's flow before it reach Miller and Lux's lands. This litigation, *Lux v. Haggin*, was a seminal water rights case and led to the Miller-Haggin Compromise of 1878, which still shapes the division of water in Kern County. Miller and Lux's prosperity continued, and by 1919 the entire area from Buttonwillow south to Old Headquarters between East Side and West Side Canals was farmed by Miller and Lux (JRP Historical Consultation, 2009).

Pioneer Canal

The Pioneer Canal was constructed in 1873. The 11.5 mile long canal originated at the Pioneer Bridge on the Kern River and continued on a westerly course. The canal was originally 10 feet wide, but was enlarged to a bed width of 30 feet for 7 to 8 miles of its length, and again in 1879, when the canal was made 60 feet wide (Grunsky, 1898). The historic alignment of the Pioneer Canal ran through the southeast corner of the Stockdale West property and through the middle of the Stockdale East property. The construction of the Cross Valley Canal in 1975 split the Pioneer Canal, which had been in disrepair, rendering it "inoperable" (Bakersfield Californian, August 13, 1976). At some point between 1973 and 1984 (based on a review of historic maps and aerial photographs), the canal was diverted near the southwestern corner of the Stockdale East property and rerouted about ¼ mile to the south, parallel to the Cross Valley Canal. This likely occurred around the time of the construction of the Cross Valley Canal. In recent years, the canal has been used by the Kern Water Bank Authority to transport water to its recharge basins (ESA, 2008).

Oil Production

Kern County has a long history of oil production. In 1864, Buena Vista Petroleum Company incorporated and began drilling and refining oil near present-day McKittrick. Kerosene was the primary product and by 1866 the company was producing between 2,500 and 3,000 gallons of kerosene a day and shipping it down the San Joaquin River to Stockton and San Francisco (Burmeister, 2003). In the 1890s, oil companies began to realize the utility of asphaltum for street paving and began production and shipment of this product.

The top producing oil fields in Kern County include Midway-Sunset, Kern River, South Belridge, Elk Hills, and Buena Vista. The proposed project is located within the Northwest Area of the Strand Oil Field.

Strand Oil Field

The Strand Oil Field was opened in June 1939 by Tide Water Associated Oil Co. on land leased from the Kern County Land Company. The discovery well, KCL No. E-35-7, produced 750 barrels of crude oil (LAT, 1939). Production of the Strand Oil Field steadily declined over the next 16 years. Production had dropped to an average of 220 barrels per day by 1955. From 1950 to 1955, only three new wells were drilled, all of which were dry. In 1955-1956, Shell Oil Company began to explore deeper depths, hitting oil at 12,360-12,410 feet. At the same time, Shell was unsuccessful in the East Strand (The Bakersfield Californian, October 16, 1956). In 1971, the field's 23 wells produced about 1,000 barrels a day (Rintoul, 1971).

Extensions of the Strand Oil Field, known as the East Area, South Area, and Northwest Area, were subsequently discovered in January 1943, September 1956, and May 1956, respectively (Matthews, 1960; Shea, 1966). The Proposed project is located within the Northwest Area of the Strand Oil Field.

The Northwest Area of the Strand Oil Field

Both the Ohio Oil Company and Standard Oil Company of California had drilled in the vicinity of the proposed project in the past, but with little success (The Bakersfield Californian, 1951). In 1951, The Texas Company (Texaco) leased land from the Kern County Land Company immediately north of the Strand Oil Field, including all of Section 1, T30S, R25E (where the Stockdale East property is located) and the west half of Section 6, T30S, R26E. Texaco's efforts appear to have been futile (Shea, 1966).

Discovery of oil deposits in the Northwest Area did not occur until May 1956 when Union Oil Company of California drilled well No. "Smith" 73-2 (located just west of the proposed project in Section 2, T30S, R25E). The same year, Shell Oil Co. entered into an oil and gas exploration option agreement with the Kern County Land Company (KCL), which included Section 3, T30S, R25E (Stockdale East property) (Bakersfield Californian, March 30, 1956). However, "Smith" 73-2 remained the only producer for eight years, until 1964 when Standard Oil Company of California completed well No. KCL 13-1 (later known as KCL 56 13-1). This well may be the same as oil derrick "Strand Well #13" documented as part of resource IRWD-KRM-004-H during survey (see Survey Results section below) (Shea, 1966: Plate 11). The area was fully developed over the next two years (1964-1966) with the addition of 11 wells (Shea, 1966).

The Northwest Area of the Strand Oil Field was never a big producer and paled in comparison to other oil producing fields in Kern County. For example, from 1964 to 1966, the Northwest Area produced a total of 764,603 barrels of oil (Shea, 1966). The Stevens Pool of the Main Area of the McKittrick Oil Field produced 3,219,641 barrels of oil (Hardoin, 1966).

Rosedale

The nearby town of Rosedale, 3.5 miles to the northeast of the proposed project, was an offshoot of Bakersfield. At the end of the 19th century, the manager of the Kern Land Company, S.W. Fergusson, used the town as a "model" to show new clients from around the world the possibilities of the fertile soil in the area. The town was settled in the 1890s by English emigrants. A drought in the middle of the decade caused many farmers to default on their loans, the land reverted back to the Kern Land Company, and Fergusson was eventually fired due to lack of profits. In 1899, the Santa Fe Railroad went through the heart of town. In the early 1900s, oil was discovered, making private land owners and the Kern Land Company very wealthy. Now, Rosedale is essentially a suburb of Bakersfield (Lynch 2006).

McKittrick Branch of the Southern Pacific Railroad

Located immediately east (about 500 feet) of the Stockdale West property and within the Central Intake Pipeline alignment is the McKittrick Branch of the Southern Pacific Railroad (SPRR). The McKittrick Branch was constructed in 1892-1893 to serve the west side oil fields. The branch line was built by SPRR in partnership with Solomon Jewett and Hugh Blodget; Jewett and Blodget were to secure the rights of way and the SPRR would build the line. The branch line transported asphalt and other oil products from McKittrick (formerly Asphalto) to the main line of the SPRR in Bakersfield. Although the branch line was originally intended to extend south to Sunset (later renamed Hazelton), the Great Panic of 1893 limited demand for oil products and the branch line terminated at McKittrick. In 1901, the line was extended 2 miles northwest of McKittrick to Olig (Brewer, 2001). The portion of the branch line from McKittrick to Olig was abandoned in 1939 and the portion from McKittrick to Buttonwillow was abandoned in 1960 (abandonedrails.com, 2012). The portion of the branch line within the proposed project appears to be currently in use.

History of the Project Area

The proposed project was once part of a land patent granted to the SPRR in 1876 (BLM Serial Number CACAAA 123427). The area later came under the ownership of the KCL. The KCL was formed in the late 19th century when James Haggin and Lloyd Tevis combined their extensive land holdings and incorporated the KCL, which focused on colonization and development. By 1960 the KCL held more than 1 million acres. In 1968 the company was acquired by Tenneco, Inc. (Brewer, 2001).

The Stockdale East property was placed into use for agriculture sometime between 1946 and 1956 (RAM, 2009). As discussed above, oil exploration and production began in this parcel in the 1960s. Stockdale West has been in use for agriculture since at least 1956 (Childers, 2010). The parcel contains an old underground irrigation distribution system of unknown date. The Pioneer Canal runs though both parcels, although some of the associated irrigation laterals (ditches) on the property have been filled in since 1967.

Geoarchaeological Review

The geomorphic setting of the project area suggests that fluvial activity associated with alluvial fan building and remodeling has been the dominant geomorphic process since the Pleistocene. A cursory visual inspection of historical aerial imagery between 1994 and 2011 reveals ground

surface patterns that appear to represent relict stream channels within the project area. If these features are relict channels, it not only suggests that Pioneer Canal may have been developed along a naturally-occurring channel, but also that the project area once contained water and probably other resources that might have attracted prehistoric people.

Given the extremely flat landscape and distance from uplands, the project area does not appear to have been susceptible to gravity-induced processes such as landslides. Eolian processes, resulting in windblown erosion and deposition, have probably played an important geomorphic role at various times in the past. In particular, removal of natural vegetation and plowing for agriculture over the last century would have made the landscape more susceptible to wind erosion. The practical effect of agricultural plowing/discing has been to churn, expose, and eventually rebury archaeological remains within the depth of plowing.

Mapped soils within the project area consist of closely-related types of sandy loams and fine sandy loams (Cajon, Excelsior, Kimberlina, Wasco, and Westhaven) formed in granitic parent material on alluvial fans and/or floodplains (NRCS, 2012). These soil types are generally moderately well drained to somewhat excessively well drained, and are well suited to agriculture. The typical profiles of these soil types do not contain significant quantities of gravel, and may exhibit stratified sands and loams between approximately 40 and 60 inches of ground surface. This stratification is evidence for long-term, repeated flooding that has led to aggradation within the valley.

The relatively small grain-size of the alluvial parent material (clay, silt, and fine sand) within the upper 60 inches of the soil solum implies the dominance of relatively low-power fluvial processes within the project area. Clays and silts in particular indicate slackwater conditions consistent with standing water characteristic of a marsh or overbank flooding of a floodplain. The absence of significant quantities of gravel suggests that the fluvial regime probably lacked the competence needed to transport items, such as lithic flakes and other artifacts, into the project area; if artifacts are present within the project area, it is unlikely that they have been substantially transported and redeposited by fluvial processes.

Parr and Osborne's (1992) broad surface survey of four proposed highway alignments in southern San Joaquin resulted in recording 33 prehistoric archaeological sites, including lithic scatters and campsites, and 14 prehistoric isolates, primarily on agricultural lands. The majority of these finds are at least 3 miles to the north and west of the proposed project; the vicinity of the current project area was surveyed, but revealed only one site (and not within the proposed project). The site distribution pattern is generally consistent with the results of archaeological work from the late-19th /early-20th century, which identified extensive archaeological remains, including intact burials, along permanent sources of water, such as Buena Vista Slough and Lake, and Goose Lake Slough, suggesting that prehistoric people favored occupation in areas with reliable water and other resources. However, Parr and Osborne's results nevertheless demonstrate that prehistoric sites, while sparse, may be found in Valley locations more distant from these water bodies.

Indeed, surveys of agricultural lands less than 1 mile from the proposed project have resulted in the discovery of a broken mano (Pruett, 1997), and stone tools/flakes (including obsidian, chert, chalecedony, and basalt), as well as fresh water clam (Sinopoli et al., 1991) at the ground surface. Geomorphically, the proposed project is within a virtually identical setting as these earlier finds which occurred within agriculturally-modified granitic soils on the same flat alluvial fan. Given the proximity of previously recorded archaeological remains, and similar geomorphic setting, it is plausible that buried prehistoric archaeological remains exist within the proposed project.

The project area itself has been modified in recent decades by agriculture, and oil production to a lesser extent. Decades of plowing and discing are likely to have obscured some stratigraphic relationships within the plowzone (depth of plowing), as archaeological remains passed through cycles of being churned, exposed and eventually reburied. Some leveling of localized topographic highs also may have occurred as a result of plowing and grading, as well as wind erosion. The combined effects of plowing and deflation has the potential to make it difficult to determine whether archaeological remains at the ground surface are within primary depositional context or have passed through one or more cycles of churning.

Evidence for stratified sand and loam deposits beneath the plowzone (Childers, 2010; NRCS, 2012) suggest that stratigraphy deeper than 1-2 feet below surface remains largely intact. If these stratified deposits formed during the Holocene, there exists a potential for intact buried archaeological remains.

Cultural Resources Research Methods and Results

Archival Research

Records Search

A records search for the proposed project was conducted on June 20, 2012 and on March 13, 2015 by staff at the Southern San Joaquin Valley Information Center (SSJVIC) housed at California State University, Bakersfield. The records search included a review of all recorded archaeological sites within a 1-mile radius of the proposed project, as well as a review of cultural resource reports on file. In addition, the California Points of Historical Interest (PHI), the California Historical Landmarks (CHL), the California Register of Historical Resources (California Register), the National Register of Historic Places (National Register), and the California State Historic Resources Inventory (HRI) listings were reviewed for properties within or adjacent to the proposed project.

The records search indicated that a total of 23 cultural resources studies have been conducted within a 1-mile radius of the proposed project. Of these 23 studies, three included portions of the project area. Approximately 40% the project area appears to have been included in past cultural resources studies.

A total of five cultural resource sites have been previously recorded within 1 mile of the proposed project (Table 1). Three of the resources are prehistoric archaeological resources (dispersed lithic scatter, mano isolate, and lithic isolate), and two of the resources are historic structures (a “Parkersburg” brand oil well pumping unit and the Strand ranch house with associated out-buildings). None of these resources are located within or immediately adjacent to the project area.

The nearest resource (P-15-15199, Strand ranch house) is mapped approximately 280 feet outside of the project area. The nearest prehistoric archaeological resource (P-15-9292, mano isolate) is located approximately 4,000 feet outside of the project area.

TABLE 3.5-1
PREVIOUSLY RECORDED CULTURAL RESOURCES WITHIN 1 MILE OF THE PROJECT AREA

Permanent Trinomial (CA-KER-)	P-Number (P-15-)	Other Designation	Description	Date Recorded
3160	3160	BEEHIVE	Prehistoric dispersed lithic scatter with 1 locus	1991
-	9292	PBM-IF-4	Prehistoric mano isolate	1998
-	12769	Glentis 9	Historic "Parkersburg" brand oil well pumping unit, not operating	2007
-	15199	-	Historic ca. 1930s one-story Strand ranch house with detached "mother-in-law" house, a pole garage, a pole barn, and a metal clad work building	2008
-	15818	-	Prehistoric chert flake isolate	2009

Historic Map and Aerial Review

Historic topographic maps (1932 and 1954 [photorevised 1973] Stevens; and 1929, 1933, and 1954 [photorevised 1973] Tupman 7.5-minute; 1942 Button Willow and 1942 Bakersfield West 15-minute; and 1912 Buena Vista Lake 30-minute USGS topographic maps) and aerial photographs (1946, 1956, 1967, 1984, 1994, 2002, 2005 [RAM, 2009; Childers, 2010]) were reviewed. All maps indicate that the property has historically consisted of undeveloped land (possibly agricultural land) with the exception of the Pioneer Canal. The canal is depicted running generally east/west through the project area. In the 1954/1973 maps, dirt roads are indicated to the south of the canal and some wells are indicated north of the canal. By 1993, the aerial photographs show that the Pioneer Canal had been abandoned while a new canal had been constructed to the south, bordering the southern boundary of the project area. The Pioneer Canal drainage ditch had been diverted around the southern portion of the eastern project parcel between 1973 and 1993. Oil derricks appear on aerial photographs beginning in 1967, but are not depicted on any of the historic maps.

Native American Contact

A Sacred Lands File search conducted by the Native American Heritage Commission (NAHC) on July 11, 2012 and on March 13, 2015 did not indicate the presence of Native American cultural resources within ½ mile of the proposed project. Follow-up contact was made by letter with all individuals and groups indicated by the NAHC as having affiliation with the project area to solicit further information concerning cultural resources in vicinity of the proposed project. Contact letters to all individuals and groups indicated by the NAHC as having affiliation with the project area were prepared and mailed on July 17, 2012 and on March 17, 2015. The letters described the proposed project and included a map indicating the location of the project area. Recipients were requested to reply with any information they are able to share about Native American resources that might be affected by the proposed project. To date, no responses have been received.

Field Reconnaissance

Survey Methodology

Stockdale East and Stockdale West were surveyed on July 11 and 12, 2012. The Central Intake Pipeline alignment (including the inlet/outlet area, pump station, and Temporary Construction Access areas) was surveyed on January 13, 2015. There were no additional surveys made within the radius for the additional third Stockdale site at this time. The Stockdale East property and Central Intake Pipeline alignment were systematically surveyed in transects spaced 50-foot (15-meter) apart. The Stockdale West parcel consisted of holding/recharge basins, constructed in 2011 by IRWD. Because of this previous disturbance, the Stockdale West property was subjected to a reconnaissance-level survey. Archaeological sites were defined as consisting of one or more cultural features or three or more artifacts (45 years old or older) within an approximate 25 square meter area. Fewer than three artifacts within 25 square meter area would be considered isolates. Archaeological resources encountered during the survey were documented and photographed. Resources were assigned temporary field designations and were recorded on appropriate Department of Parks and Recreation (DPR) 523 forms. No subsurface investigation was performed and no artifacts were collected during the survey.

Survey Results

Both Stockdale East and Stockdale West contained agricultural fields with some non-agricultural elements within the parcel. The Stockdale West property contained eight, near-equal sized basins divided by raised levees that also served as access roads. The basins are 1-2 meters below ground surface. The dirt from the ponds was apparently used to build the surrounding levees. The southeastern field contained alfalfa and the remaining fields contained a type of thistle. The surface visibility in the alfalfa was 30 to 60 percent, while the fields of thistle had a surface visibility of 80 to 100 percent. An electrical substation is in the northeastern corner of the project area. One resource, a segment of the Pioneer Canal (IRWD-KRM-003-H), was recorded within this parcel.

The Stockdale East property contains nine fields of various sizes divided by dirt roads. The eastern five fields contained four fields of alfalfa surrounding one field of onion, the southwestern two fields were fallow with silty sand, and the northwestern two fields had cotton. The surface visibility within the cotton fields was 20 to 30 percent as they were actively harvesting the cotton. The surface visibility within the alfalfa fields was 10 to 30 percent. The onion field had a surface visibility of 30 to 50 percent. Visibility within areas containing derricks and tanks (see IRWD-KRM-004-H) was near 100 percent. Two resources, an abandoned portion of the Pioneer Canal (IRWD-KRM-003-H) and a complex of oil production related features (IRWD-KRM-004-H), were encountered during the survey within this parcel, both in the western portion of the parcel.

The Central Intake Pipeline alignment consists of dirt access roads and areas of future dirt access roads located between active agricultural fields and almond orchards. Ground visibility varied from 95 to 100 percent throughout the survey area. Areas that were obscured were due to the presence of parked agricultural vehicles and equipment, and the gravely area along the railroad. Approximately 90 percent of the survey area was subject to pedestrian survey. The portion that was not surveyed consists of private property where permission to enter could not be obtained. Sediments within the survey area consist of a light to dark brown and grey, fine, sandy loams

with some areas mixed with coarse sand. The survey area appears to have been previously disturbed by agriculture and previous grading. No prehistoric or historic-period archaeological resources were encountered in this area. One historic-period built resource was encountered during the survey: a segment of the McKittrick Branch of the SPRR, which is currently still in use.

Cultural Resources within the Project Area

IRWD-KRM-003-H

This resource consists of two discontiguous segments of the historic Pioneer Canal. The portion of the Pioneer Canal within the Stockdale West property is nearly 1000 feet long, while the segment of the canal within the Stockdale East property is about 440 feet long. The earthen canal is trapezoidal in profile, and measures approximately 70 feet wide at the top, 15 feet wide at the base, and 10 feet deep. The canal runs ENE/WSW and continues outside of the project area in both directions. The 440-foot section of the historic Pioneer Canal within the Stockdale East property was abandoned when the canal was diverted to the south. This abandoned section is similar in dimension and construction to the segment recorded within the Stockdale West property. Although historically the canal would have continued ESE through the Stockdale East property, the rest of the historic canal's alignment through the parcel was filled with earth and is now used as a road. Oil production activities have impacted the abandoned canal with a 12 inch steel pipe crossing around the mid-point and discarded debris at the east end of the canal.

Resource IRWD-KRM-003-H, the circa 1873 Pioneer Canal, is recommended as not eligible for listing in the California Register and does not otherwise meet CEQA's definitions for a historical resource. Although one of the earliest water conveyance canals constructed in Kern County, based on the research conducted for this current study, the resource cannot be tied to specific historically significant events or persons (California Register Criteria 1 and 2). The canal, which is a trapezoidal-shaped type common throughout California in the 19th and 20th century) does not represent a distinctive type, style, or manufacture technology (California Register Criterion 3). The canal does not have the potential to yield information important in history (California Register Criterion 4). Although the canal is still used to transport water to recharge basins, the canal ceased to be used for irrigation in the 1970s with the construction of the Cross Valley Canal. The segment of the Pioneer Canal in the Stockdale East property was realigned in the 1970s, and the remainder of the canal through the Stockdale East property has been filled in and serves as a road; therefore, this segment of the canal no longer maintains integrity. For these reasons, resource IRWD-KRM-003-H is recommended not eligible for listing in the California Register and is not otherwise significant under CEQA.

IRWD-KRM-004-H

This complex of 15 oil production related features was recorded within the Stockdale West property. The site is approximately 72 acres in area. The features include two steel tanks, a complex of compressor tanks and pipelines, three concrete machinery foundations, two vertical pipes, and asphalt access road, three oil derricks, and three oil well heads. These 15 features are likely associated with oil exploration and production in the Northwest Area of the Strand oil field. A "1963" date of manufacture was recorded on a plaque on a tank (Feature 4), and based on an examination of historic maps and aerial photographs, most features likely date to the 1960s. The

locations and designations of six of the features appear to correlate with the mapped location of six oil wells as depicted in Plate 11 of Shea, 1966.

Resource IRWD-KRM-004-H is a complex of built features and associated debris scatter that appears to be associated with oil exploration and production in the Northwest Area of the Strand Oil Field. The Northwest Area of the Strand Oil Field was never a big producer relative to other oil producing fields in Kern County. For example, from 1964 to 1966, the Northwest Area produced a total of 764,603 barrels of oil (Shea, 1966). During the same period, the Stevens Pool of the Main Area of the McKittrick Oil Field produced 3,219,641 barrels of oil (Hardoin, 1966). The largest producers of oil in Kern County, such as the Midway-Sunset and Kern River Oil Fields, have produced over two billion barrels of oil to date.

Although the resource is associated with oil production in the Northwest Area of the Strand Oil Field, the Northwest Area was never a major producer or historically important, and therefore the resource is not associated with historically significant events or persons (California Register Criteria 1 and 2). The features within the resource do not represent a distinctive type, style, or manufacture technology; similar oil infrastructure features are ubiquitous throughout California (California Register Criterion 3). The resource does not have the potential to yield information important in history (California Register Criterion 4). For these reasons, resource IRWD-KRM-004-H is recommended not eligible for listing in the California Register and is not otherwise significant under CEQA.

McKittrick Branch of the SPRR

A segment of the McKittrick Branch of the SPRR was documented in the Central Intake Pipeline alignment. The segment consists of two parallel rows of tracks oriented along a northwest-southeast axis and measures approximately 100 feet long and 5 feet wide. The McKittrick Branch of the SPRR was constructed in 1892-1893 to serve the west side oil fields. The segment of the branch line within the project area is in excellent condition and appears to be still in use. The segment of the McKittrick Branch of the SPRR has not been evaluated for listing in California Register since it will be avoided through the use of jack-and-bore or similar tunneling construction methods, and as a result there would be no direct impact to the resource.

Paleontological Resources Research Methods and Results

A paleontological literature search was conducted by staff at the Los Angeles County Natural History Museum (LACM) (McLeod, 2012, 2015). This included a review of regional geological maps and a search of the LACM's collections and fossil locality database in order to identify any paleontological resources known to exist within or near the project area.

The results of the literature search indicated that the majority of the project area appears to be underlain by younger Quaternary Alluvium. While significant vertebrate fossils are unlikely to be contained in the uppermost layers, deeper excavations into the underlying older Quaternary Alluvium retain the potential to uncover fossil vertebrates. No fossil localities have been previously recorded within the project area, but several fossil localities had been recorded nearby in the same type of sediments that underlie the project area. Nearby fossil recoveries were associated with Quaternary Alluvium south-southwest of the project area in brea deposits near

Bitter Creek, southeast of Maricopa, including a number of Quaternary vertebrate fossils (McLeod, 2012, 2015).

3.5.2 Regulatory Setting

Federal

National Register of Historic Places

The National Register was established by the National Historic Preservation Act (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 historic resources and to indicate what properties should be considered for protection from destruction or impairment" (Code of Federal Regulations [CFR] 36 Section 60.2). The National Register recognizes both historical-period and prehistoric properties that are significant at the national, state, and local levels.

To be eligible for listing in the National Register, a resource must be significant in American history, architecture, archaeology, engineering, or culture. Districts, sites, buildings, structures, and objects of potential significance must meet one or more of the following four established criteria (U.S. Department of the Interior, 1995):

A. Are associated with events that have made a significant contribution to the broad patterns of our history;

B. Are associated with the lives of persons significant in our past;

C. Embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. Have yielded, or may be likely to yield, information important in prehistory or history.

Unless the property possesses exceptional significance, it must be at least fifty years old to be eligible for National Register listing (U.S. Department of the Interior 1995).

In addition to meeting the criteria of significance, a property must have integrity. Integrity is defined as "the ability of a property to convey its significance" (U.S. Department of the Interior 1995). The National Register recognizes seven qualities that, in various combinations, define integrity: location, design, setting, materials, workmanship, feeling, and association. To retain historic integrity a property must possess several, and usually most, of these seven aspects. Thus, the retention of the specific aspects of integrity is paramount for a property to convey its significance.

State

The State implements the NHPA through its statewide comprehensive cultural resources surveys and preservation programs. The California Office of Historic Preservation (OHP), as an office of the California Department of Parks and Recreation (DPR), implements the policies of the NHPA on a statewide level. The OHP also maintains the California Historic Resources Inventory. The

State Historic Preservation Officer (SHPO) is an appointed official who implements historic preservation programs within the State's jurisdictions.

California Register of Historical Resources

The California Register is "an authoritative listing and guide to be used by State and local agencies, private groups, and citizens in identifying the existing historical resources of the State and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change" (California Public Resources Code § 5024.1[a]). The criteria for eligibility for the California Register are based upon National Register criteria (California Public Resources Code § 5024.1[b]). Certain resources are determined by the statute to be automatically included in the California Register, including California properties formally determined eligible for, or listed in, the National Register.

To be eligible for the California Register, a prehistoric or historic-period property must be significant at the local, State, and/or federal level under one or more of the following four criteria:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important in our past;
3. 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. Has yielded, or may be likely to yield, information important in prehistory or history.

A resource eligible for the California Register must meet one of the criteria of significance described above, and retain enough of its historic character or appearance (integrity) to be recognizable as a historical resource and to convey the reason for its significance. It is possible that a historic resource may not retain sufficient integrity to meet the criteria for listing in the National Register, but it may still be eligible for listing in the California Register.

Additionally, the California Register consists of resources that are listed automatically and those that must be nominated through an application and public hearing process. The California Register automatically includes the following:

- California properties listed on the National Register and those formally Determined Eligible for the National Register;
- California Registered Historical Landmarks from No. 770 onward; and,
- Those California Points of Historical Interest that have been evaluated by the OHP and have been recommended to the State Historical Commission for inclusion on the California Register.

Other resources that may be nominated to the California Register include:

- Historical resources with a significance rating of Category 3 through 5 (those properties identified as eligible for listing in the National Register, the California Register, and/or a local jurisdiction register);
- Individual historical resources;
- Historical resources contributing to historic districts; and,
- Historical resources designated or listed as local landmarks, or designated under any local ordinance, such as an historic preservation overlay zone.

California Environmental Quality Act

CEQA is the principal statute governing environmental review of projects occurring in the State and is codified at PRC Section 21000 et seq. CEQA requires lead agencies to determine if a proposed project would have a significant effect on the environment, including significant effects on historical or archaeological resources.

Under CEQA (Section 21084.1), a project 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. The *CEQA Guidelines* (Section 15064.5) recognize that an historical resource includes: (1) a resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register; (2) a resource included in a local register of historical resources, as defined in PRC Section 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g); and (3) any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California by the lead agency, provided the lead agency's determination is supported by substantial evidence in light of the whole record. The fact that a resource does not meet the three criteria outlined above does not preclude the lead agency from determining that the resource may be an historical resource as defined in PRC Sections 5020.1(j) or 5024.1.

If a lead agency determines that an archaeological site is a historical resource, the provisions of Section 21084.1 of CEQA and Section 15064.5 of the *CEQA Guidelines* apply. If a project may cause a substantial adverse change (defined as 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) in the significance of an historical resource, the lead agency must identify potentially feasible measures to mitigate these effects (*CEQA Guidelines* Sections 15064.5(b)(1), 15064.5(b)(4)).

If an archaeological site does not meet the criteria for a historical resource contained in the *CEQA Guidelines*, then the site may be treated in accordance with the provisions of Section 21083, which is a unique archaeological resource. As defined in Section 21083.2 of CEQA a "unique" archaeological resource is an archaeological artifact, object, or site, about which it can be clearly demonstrated that without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information;
- Has a special and particular quality such as being the oldest of its type or the best available example of its type; or,
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

If an archaeological site meets the criteria for a unique archaeological resource as defined in Section 21083.2, then the site is to be treated in accordance with the provisions of Section 21083.2, which state that if the lead agency determines that a project would have a significant effect on unique archaeological resources, the lead agency may require reasonable efforts be made to permit any or all of these resources to be preserved in place (Section 21083.1(a)). If preservation in place is not feasible, mitigation measures shall be required.

The *CEQA Guidelines* note that if an archaeological resource is neither a unique archaeological nor a historical resource, the effects of the project on those resources shall not be considered a significant effect on the environment (*CEQA Guidelines* Section 15064.5(c)(4)).

Local

Kern County General Plan

The Kern County General Plan (section 1.10.3) contains the following relevant cultural resources policies and measures:

Policy 25: The County will promote the preservation of cultural and historic resources which provide ties with the past and constitute a heritage value to residents and visitors.

Implementation Measure K: Coordinate with the California State University, Bakersfield's Archaeology Inventory Center.

Implementation Measure L: The County shall address archaeological and historical resources for discretionary projects in accordance with the California Environmental Quality Act (CEQA).

Implementation Measure N: The County shall develop a list of Native American organizations and individuals who desire to be notified of proposed discretionary projects. This notification will be accomplished through the established procedures for discretionary projects and CEQA documents.

Implementation Measure O: On a project specific basis, the County Planning Department shall evaluate the necessity for the involvement of a qualified Native American monitor for grading or other construction activities on discretionary projects that are subject to a CEQA document.

Paleontological Resources

Federal

A variety of federal statutes specifically address paleontological resources. They are generally applicable to a project if that project includes federally owned or federally managed lands or involves a federal agency license, permit, approval, or funding. Federal legislative protection for paleontological resources stems from the Antiquities Act of 1906 (PL 59-209; 16 United States Code 431 et. seq.; 34 Stat. 225), which calls for protection of historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest on federal lands.

State

Paleontological resources are also afforded protection by CEQA. Appendix G (Part V) of the *CEQA Guidelines* provides guidance relative to significant impacts on paleontological resources, stating that a project will normally result in a significant impact on the environment if it will "…disrupt or adversely affect a paleontologic resource or site or unique geologic feature, except as part of a scientific study." Section 5097.5 of the Public Resources Code specifies that any unauthorized removal of paleontological remains is a misdemeanor. Further, the California Penal Code Section 622.5 sets the penalties for the damage or removal of paleontological resources.

Local

Kern County General Plan

The Kern County General Plan includes a Cultural Resources Element, which establishes a process for the early identification, consideration, and where appropriate, preservation of historical, archaeological, and paleontological resources (see above).

Professional Standards

The Society for Vertebrate Paleontology (SVP) has established standard guidelines for acceptable professional practices in the conduct of paleontological resource assessments and surveys, monitoring and mitigation, data and fossil recovery, sampling procedures, and specimen preparation, identification, analysis, and curation. Most practicing professional paleontologists in the nation adhere closely to the SVP's assessment, mitigation, and monitoring requirements as specifically provided in its standard guidelines. Most California State regulatory agencies accept the SVP standard guidelines as a measure of professional practice.

3.5.3 Impact Assessment

Thresholds of Significance

The following criteria from Appendix G of the *CEQA Guidelines* are used as thresholds of significance to determine the impacts of the proposed project as related to cultural resources. The proposed project would have a significant impact if it would:

1. Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5.

2. Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5.
3. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.
4. Disturb any human remains, including those interred outside of formal cemeteries.

Thresholds 1 and 2. Historical and Archaeological Resources

Impact CUL-1: The project could cause a substantial adverse change in the significance of a historical or archaeological resource, as defined in CEQA Guidelines Section 15064.5.

Three resources, IRWD-KRM-003-H (two segments of the Pioneer Canal), IRWD-KRM-004-H (complex of oil-related features), and a segment of the McKittrick Branch of the SPRR, were recorded within the project area. Resources IRWD-KRM-003-H and IRWD-KRM-004-H are not recommended eligible for listing in the California Register or otherwise considered a historical resource or unique archaeological resource under CEQA. The segment of the McKittrick Branch of the SPRR has not been evaluated for listing in California Register since it will be avoided through the use of jack-and-bore or similar tunneling construction methods, and as a result there would be no direct impact to the resource.

The project area has been highly impacted by agriculture and excavation. The Stockdale West property was observed to have been highly disturbed through the recent construction of recharge basins; little of the original ground surface remained. Given the lack of reliable water sources, it is unlikely that large, permanent prehistoric settlements would have occurred within the project area. However, based on the depositional environment and the number of prehistoric resources that have been recorded in the vicinity in similar conditions, although overall there is a low probability of significant archaeological resources existing within the project area, there is nevertheless some possibility that buried and previously unknown and undisturbed archaeological deposits may be encountered during project-related excavation, particularly below the plow zone.

Impact Determination

The proposed project would have no impact on known historical or unique archaeological resources located at Stockdale East, r Stockdale West, or Central Intake Pipeline alignment. However, the project area may be sensitive for buried and previously unknown archaeological resources. Inadvertent damage to significant buried archaeological deposits during construction would be a significant impact. Implementation of **Mitigation Measure CUL-1**, however, would reduce the impact to a less-than-significant level.

The proposed project includes a third Stockdale site located within the radius identified on Figure 2-2. The location of the third Stockdale site has yet to be determined. As such, a cultural survey has not been conducted for this project component. In accordance with **Mitigation Measure CUL-2**, once the third property has been identified, an additional Phase I cultural resources study shall be conducted to identify potential for impacts to historical or archaeological resources as defined in CEQA Guidelines Section 15064.5.

Significance Conclusion

Less than Significant with Mitigation.

Mitigation Measures

CUL-1: In the event that prehistoric or historic subsurface cultural resources are discovered during ground-disturbing activities, all work within 50 feet of the resources will be halted and Rosedale or IRWD (as applicable) will consult with a qualified archaeologist to assess the significance of the find according to *CEQA Guidelines* Section 15064.5. If any find is determined to be significant, then Rosedale or IRWD and the archaeologist will meet to determine the appropriate avoidance measures or other appropriate mitigation. Rosedale or IRWD (as applicable) will make the final determination. All significant cultural materials recovered will be, as necessary and at the discretion of the consulting archaeologist, subject to scientific analysis, professional museum curation, and documentation according to current professional standards.

In considering any suggested mitigation proposed by the consulting archaeologist in order to mitigate impacts to historical resources or unique archaeological resources, Rosedale or IRWD will determine whether avoidance is necessary and feasible in light of factors such as the nature of the find, project design, costs, and other considerations. If avoidance is infeasible, other appropriate measures (e.g., data recovery) will be instituted. Work may proceed on other parts of the project site while mitigation for historical resources or unique archaeological resources is being carried out.

CUL-2: For any project components not previously subject to archaeological survey (e.g., the third Stockdale site), prior to the initiation of ground disturbance, a qualified archaeologist shall be retained to carry out a Phase I Cultural Resources Survey of the project component. The Phase I Survey shall identify and evaluate the significance of any resources that may be directly or indirectly impacted by the proposed project. The Phase I Survey effort shall be documented in a Phase I Report. If as a result of the additional Phase I Survey any resource is found to be a historical or unique archaeological resource as defined in PRC Section 21084.1 and 21083.2(g), respectively, then **Mitigation Measure CUL-1** shall be implemented.

Threshold 3. Paleontological Resources

Impact CUL-2: The project could directly or indirectly affect a unique paleontological resource or site or unique geologic feature, as defined in CEQA Guidelines Section 15064.

The majority of the project area appears to be underlain by younger Quaternary Alluvium. While significant vertebrate fossils are unlikely to be contained in the uppermost layers, deeper excavations into the underlying older Quaternary Alluvium retain the potential to uncover fossil vertebrates. While the depth of the younger alluvium beneath the project area is unknown, thickness of Quaternary younger alluvial sediments varies in the southern San Joaquin Valley

area from a few inches to up to 30 feet. Therefore, there exists the possibility that paleontological resources may be impacted by the project.

Impact Determination

For implementation of facilities associated with Stockdale East, Stockdale West, and the Central Intake Pipeline alignment, the implementation of **Mitigation Measure CUL-3** would reduce impacts to paleontological resources to less than significant levels.

The proposed project includes a third Stockdale site, located within the radius identified on Figure 2-2. The location of the third Stockdale site has yet to be determined. In accordance with **Mitigation Measure CUL-4**, once the third property has been identified, an additional paleontological resources literature review shall be conducted along with recommendations for the need to implement **Mitigation Measure CUL-3**.

Significance Conclusion

Less than Significant with Mitigation.

Mitigation Measures

CUL-3: In the event that paleontological resources are discovered, Rosedale or IRWD (depending upon the project component) will notify a qualified paleontologist. The paleontologist will document the discovery as needed, evaluate the potential resource, and assess the significance of the find under the criteria set forth in *CEQA Guidelines* Section 15064.5. If fossil or fossil bearing deposits are discovered during construction, excavations within 50 feet of the find will be temporarily halted or diverted until the discovery is examined by a qualified paleontologist. The paleontologist will notify the appropriate agencies to determine procedures that would be followed before construction is allowed to resume at the location of the find. If Rosedale or IRWD determines that avoidance is not feasible, the paleontologist will prepare an excavation plan for mitigating the effect of the project on the qualities that make the resource important. The plan will be submitted to Rosedale or IRWD for review and approval prior to implementation.

CUL-4: Once the location of the third Stockdale site is determined (or any additional project components), prior to the initiation of ground disturbance, a paleontological literature, map, and museum locality review shall be conducted in order to assess the paleontological sensitivity of the project component. If the literature, map, and museum locality review identifies potentially sensitive paleontological resources, then a qualified paleontologist shall be retained to conduct a pedestrian survey and assessment of the project component. A report shall be prepared which summarizes the results of the survey and assessment and provides recommendations regarding implementation of mitigation, such as **Mitigation Measure CUL-3**.

Threshold 4. Human Remains

Impact CUL-3: The proposed project could result in adverse impacts to human remains.

Impact Determination

There is no indication, either from the archival research results or the archaeological survey, that any particular location in the project area has been used for human burial purposes in the recent or distant past. However, in the event that human remains are inadvertently discovered during project construction activities, the human remains could be inadvertently damaged, which could be a significant impact. Implementation of **Mitigation Measure CUL-5** would reduce impacts to human remains to a less-than-significant level.

Significance Conclusion

Less than Significant with Mitigation.

Mitigation Measures

CUL-5: If human remains are uncovered during project construction, Rosedale or IRWD (as applicable) shall immediately halt work, contact the Kern County Coroner to evaluate the remains, and follow the procedures and protocols set forth in Section 15064.4 (e)(1) of the *California Environmental Quality Act Guidelines*. If the Coroner determines the remains are Native American in origin, the Coroner shall contact the Native American Heritage Commission (NAHC). As provided in Public Resources Code Section 5097.98, the NAHC shall identify the person or persons believed to be most likely descended from the deceased Native American. The most likely descendent shall be afforded the opportunity to provide recommendations concerning the future disposition of the remains and any associated grave goods as provided in PRC 5097.98.

References – Cultural Resources

abandonedrails.com, The McKittrick Branch, online resource http://www.abandonedrails.com/McKittrick_Branch accessed on December 5, 2012.

Arkush, Brook, "Yokuts Trade Networks and Native Culture Change in Central and Eastern California", *Ethnohistory*, Vol. 40, No. 4 (619-640), Autumn, 1993.

The Bakersfield Californian

Oilfields, October 1, 1951 page 35

Kern County Oil Fields, March 30, 1956, page 26

Strand Oil Future Bright, October 16, 1956 page 23

Additional Turnouts Demanded for CVC, August 13, 1976, page 14

Brewer, Chris, *Historic Kern County: An Illustrated History of Bakersfield and Kern County*, Historical Publishing Network, San Antonio, Texas, 2001.

Burmeister, Eugene. "From an April 20, 1972 Bakersfield Californian Article on Kern County Oil History", excerpted in *Historic Kern: the Kern County Historical Society Quarterly Bulletin*, 53(3), Fall 2003.

Childers, Kathlien, *Phase I Environmental Site Assessment, Grimmway Property, APNS 160-020-12 and 160-020-23, Kern County, California*. Prepared by Kleinfelder West, Inc., Fresno. Prepared for Dee Jaspar & Associates, Bakersfield. On file, ESA, Los Angeles. 2010.

Department of the Interior, *Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (As Amended and Annotated),* http://www.nps.gov/history/local-law/arch_stnds_0.htm, accessed August 28, 2008.

DWR (California Department of Water Resources), *California's Groundwater: Tulare Lake Hydrologic Region, San Joaquin Valley Groundwater Basin.* Bulletin 118, 2003.

ECORP, *Tulare Lake Basin Hydrology and Hydrography, A Summary of the Movement of Water and Aquatic Species,* prepared for USEPA, April 12, 2007.

Ehringer, Candace and Matthew Gonzalez, *Stockdale Integrated Banking Project – Addendum to IRWD Stockdale West Ranch Joint Banking Project: Phase I Cultural Resources Study*, prepared for Irvine Ranch Water District and Rosedale Rio Bravo Water Storage District, March 2015.

Ehringer, Candace, Christopher Lockwood, and Brian Marks, *IRWD Stockdale West Ranch Joint Banking Project Draft Phase I Cultural Resources Study*, prepared for Irvine Ranch Water District and Rosedale Rio Bravo Water Storage District, September 2013.

Environmental Science Associates (ESA) *Strand Ranch Integrated Banking Project, Final Environmental Impact Report*. Prepared by ESA, Los Angeles. Prepared for Rosedale-Rio Bravo Water Storage District. On file, ESA, Los Angeles. 2008.

Fagan, Brian, *Before California*, Rowman & Littlefield Publishers Inc., Lanham, MD, 2003.

Grunsky, Carl Ewald, *Irrigation Near Bakersfield, California*, Water-Supply and Irrigation Papers of the United States Geological Society No. 17, Washington, D.C., 1898.

Hardoin, John L., Stevens Pool of the Main Area of McKittrick Oil Field, in *Summary of Operations, California Oil Fields, Fifty-Second Annual Report of the State Oil and Gas Supervisor Issued by State of California, The Resources Agency, Department of Conservation, Division of Oil and Gas*, Vol. 52 No. 1, pp. 29-36, 1966.

Igler, David, *Industrial Cowboys: Miller and Lux and the Transformation of the Far West 1850-1920*, University of California Press, Berkeley, 2001.

JRP Historical Consulting, *Historic Architecture Technical Report: Inventory and Evaluation, Hydrogen Energy California Project*, submitted to URS Corporation, April, 2009.

Kyle, D. E., *Historic Spots in California*. Stanford, CA: Stanford University Press, 1990

Los Angeles Times [LAT]. New Oil Strike in Kern County, Los Angeles Times June 7, 1939. Page 14

Lynch, George G., Rambling Rosedale, *Kern County Historical Society, Quarterly Bulletin, Historic Kern* 56(3), 2006

Matthews, John F., Strand Oil Field, in *Summary of Operations, California Oil Fields, Forty-Sixth Annual Report of the State Oil and Gas Supervisor Issued by Department of Natural Resources, Division of Oil and Gas*, Vol. 46 No. 1, pp. 17-26, 1960.

McLeod, Samuel, Letter Re: Paleontological Resources for the proposed IRWD Stockdale West Ranch Joint Banking Project, ESA Project # 211181, near Rosedale, Kern County project area, July 24, 2012.

Morgan, Wallace M., *History of Kern County, California : with biographical sketches of the leading men and women of the county who have been identified with its growth and development from the early days to the present*, Historic Record Company, Los Angeles, 1914

NRCS (Natural Resources Conservation Service), *Web Soil Survey*. Electronic resource, http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx, accessed August 13, 2012.

Parr, Robert E., and Richard Osborne, *Route Adoption Study for Highway 58, Kern County, California*. Prepared by Cultural Resource Facility, California State University, Bakersfield. Prepared for California Department of Transportation, Fresno. On file, South San Joaquin Archaeological Information Center, California State University, Bakersfield. 1992.

Pruett, Catherine L., *A Cultural Resources Assessment and Plan for the Kern Water Bank Authority Project near Bakersfield, Kern County, California*. Prepared by Three Girls and A Shovel, Bakersfield. Prepared for Kern Water Bank Authority, Bakersfield. On file, South San Joaquin Archaeological Information Center, California State University, Bakersfield. 1997.

RAM Environmental Engineering Services, Inc., *Rosedale Rio Bravo Water Storage District, Phase I Environmental Assessment (ESA-1), APN#'s 160-010-39, and 42, Bakersfield, CA.* Prepared by RAM Environmental Engineering Services, Inc., Bakersfield. Prepared for Rosedale Rio Bravo Water Storage District, Bakersfield. On file, ESA, Los Angeles. 2009.

Rintoul, Bill, Kern County Oilfields News, The Bakersfield Californian, March 26, 1971 page 25

Rosenthal, Jeffrey S., Gregory G. White, and Mark Q. Sutton, The Central Valley: A View from the Catbird's Seat, in *California Prehistory: Colonization, Culture, and Complexity*, pp. 147-163, edited by T. L. Jones and K.A. Klar, AltaMira Press, Lanham, MD, 2007.

Shea, D.N., Northwest Area of Strand Oil Field, in *Summary of Operations, California Oil Fields, Fifty-Second Annual Report of the State Oil and Gas Supervisor Issued by State of California, The Resources Agency, Department of Conservation, Division of Oil and Gas*, Vol. 52 No. 1, pp. 47-57, 1966.

Sinopoli, C., R. Osborne, and S. Harris, *Archaeological Site Record: CA-KER-3160*. Prepared by Cultural Resource Facility, California State University, Bakersfield. On file, South San Joaquin Archaeological Information Center, California State University, Bakersfield. 1991.

U.S. Department of the Interior, National Park Service, *National Register Bulletin: How to Apply the National Register Criteria for Evaluation*, National Park Service, Washington, DC., 1995.

Wallace, William J., Southern Valley Yokuts, in *Handbook of North American Indians, Volume 8, California*, pp. 448-461, edited by R. F. Heizer, Smithsonian Institution, Washington, DC, 1978.

3.6 Geology, Soils, and Seismicity

This chapter addresses the potential impacts of the proposed project associated with geology, soils, and seismicity in accordance with the significance criteria established in Appendix G of the *CEQA Guidelines.* This chapter evaluates whether construction and operation of the proposed project would result in potential adverse impacts related to local geology, existing soil conditions, or seismicity.

3.6.1 Environmental Setting

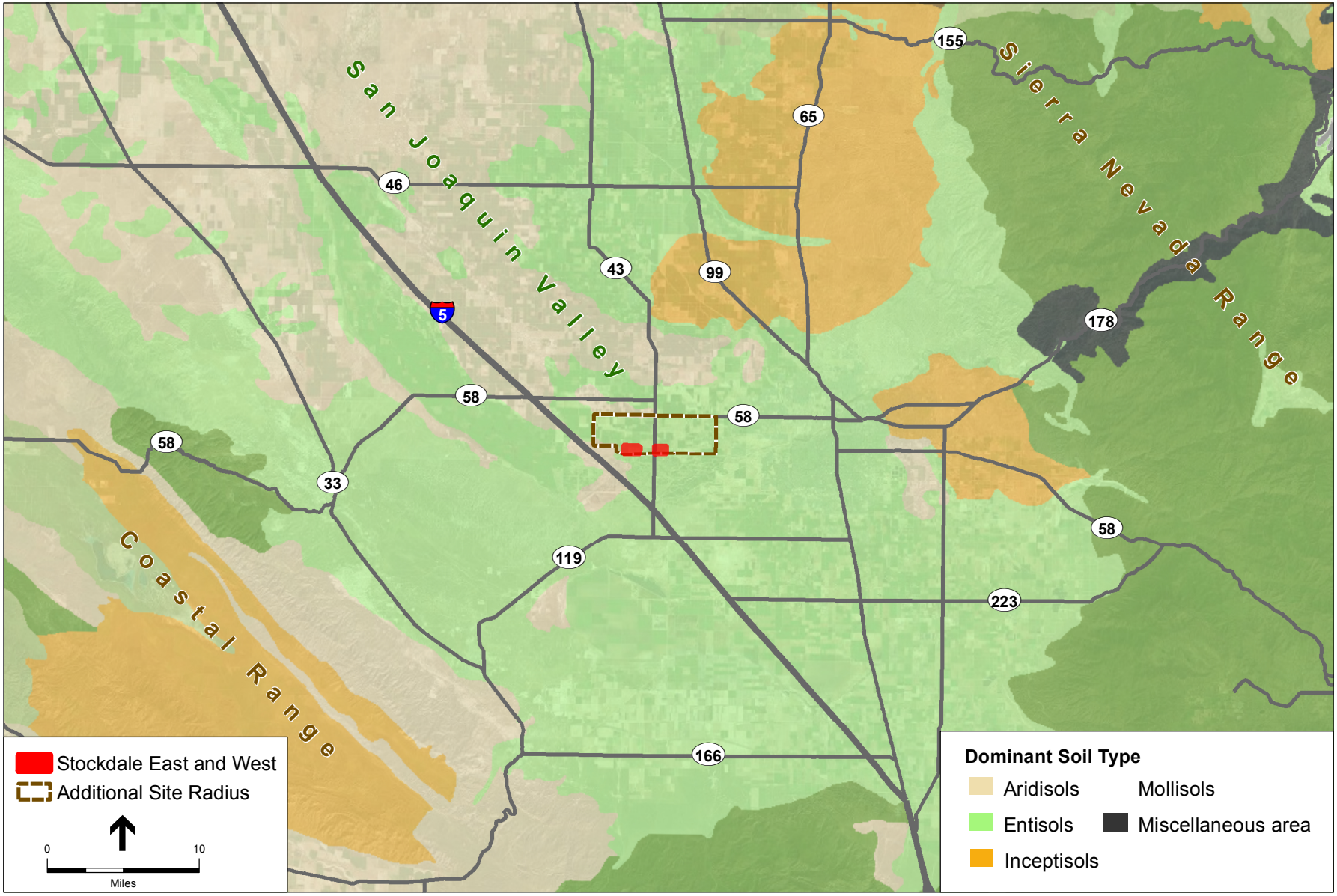
Regional Geology

The project site lies within the region of California referred to as the Great Valley geomorphic province.[1] The Great Valley geomorphic province is a long alluvial plain that runs approximately 400 miles through central California (CGS, 2002). The Great Valley can be further divided into the northern Sacramento Valley and the southern San Joaquin Valley. The project site is located within the San Joaquin Valley which is flanked by the Sierra Nevada Range to the east, and the Coast Range to the west as shown in **Figure 3.6-1**. Sediments located within the project area range in age from the Jurassic to Holocene period. Granitic and metamorphic rocks outcrop along most of the eastern and southern flanks of the Great Valley and marine rocks of pre-Tertiary age outcrop along most of the western flank. Post-Eocene-aged continental rocks and deposits found in this area contain most of the fresh groundwater and are underlain by or contain saline water at depth.

The Coast Range is dominated by the northwest trending San Andreas fault. Large coalescing alluvial fans have developed along each side of the valley (CGS, 2002). The larger and more gently sloping fans on the east side consist of deposits derived from the massive intrusive igneous rock sources of the Sierra Nevada; whereas, the smaller and more steeply sloping fans on the west side are built up by sediments originating from predominantly sedimentary rocks of the Coast Range. As a result, the valley floor consists mainly of two kinds of alluvial materials that differ widely in provenance and their respective engineering properties (CGS, 2002).

The Sierra Nevada block has been tilted westward, caused by faulting and uplifting of the eastern edge. The western side is depressed and overlain by the sedimentary deposits of the valley. The southern boundary of the Sierra Nevada block is the east-west running Garlock fault. The site is located on alluvial deposits derived from the Sierra Nevada Range near the southern boundary of the San Joaquin Valley.

[1] A geomorphic province is an area that possesses similar bedrock, structure, history, and age. California has 11 geomorphic provinces (CGS, 2002).



SOURCE: ESRI 2013, USDA Natural Resources Conservation Service (SSURGO)

Stockdale Integrated Banking Project . 211181

Figure 3.6-1

Geology of the San Joaquin Valley

Topography and Soils

The project area is located within the southern end of the San Joaquin Valley on the relatively flat Valley floor. The project area is generally covered with fine silty sand to sandy silt containing about 50 percent to 75 percent sand particles. The project sites are covered by Wasco fine sandy loam soils, Kimberlina fine sandy loam soils, Kimberlina sandy loam soils, and Westerhaven fine sandy loam soil. Wasco is characterized as deep and moderately deep, moderately well and well-drained soils with moderately coarse textures. Kimberlina fine sandy loam has a moderate infiltration rate, considered a moderately well to well-drained soil, and has a moderately coarse texture. Kimberlina sandy loam soils have a moderate infiltration rate, have a moderately well to well-drained soil, and consist of a moderately coarse texture. Westerhaven fine sandy loam has a moderate infiltration rates, is moderately well to well-drained soil, and has a moderately coarse texture.

The Stockdale West property is underlain by dense sands at a depth of 24 to 44 feet. Kimberlina sandy loam is found at the highland protruding into the southwest portion of the Stockdale West property and some encroachment of the Westhaven fine sandy loam along the extreme west and northwest border of the property. The Wasco, Kimberlina, and upper foot of the Westerhaven units are relatively similar (Kleinfelder West, 2010). The Stockdale East property soils have been classified as Wasco Sandy Loam, Wasco Fine Sandy Loam, and Excelsior Sandy Loam, all of which are characterized as deep and well drained soils resultant from alluvial fans.

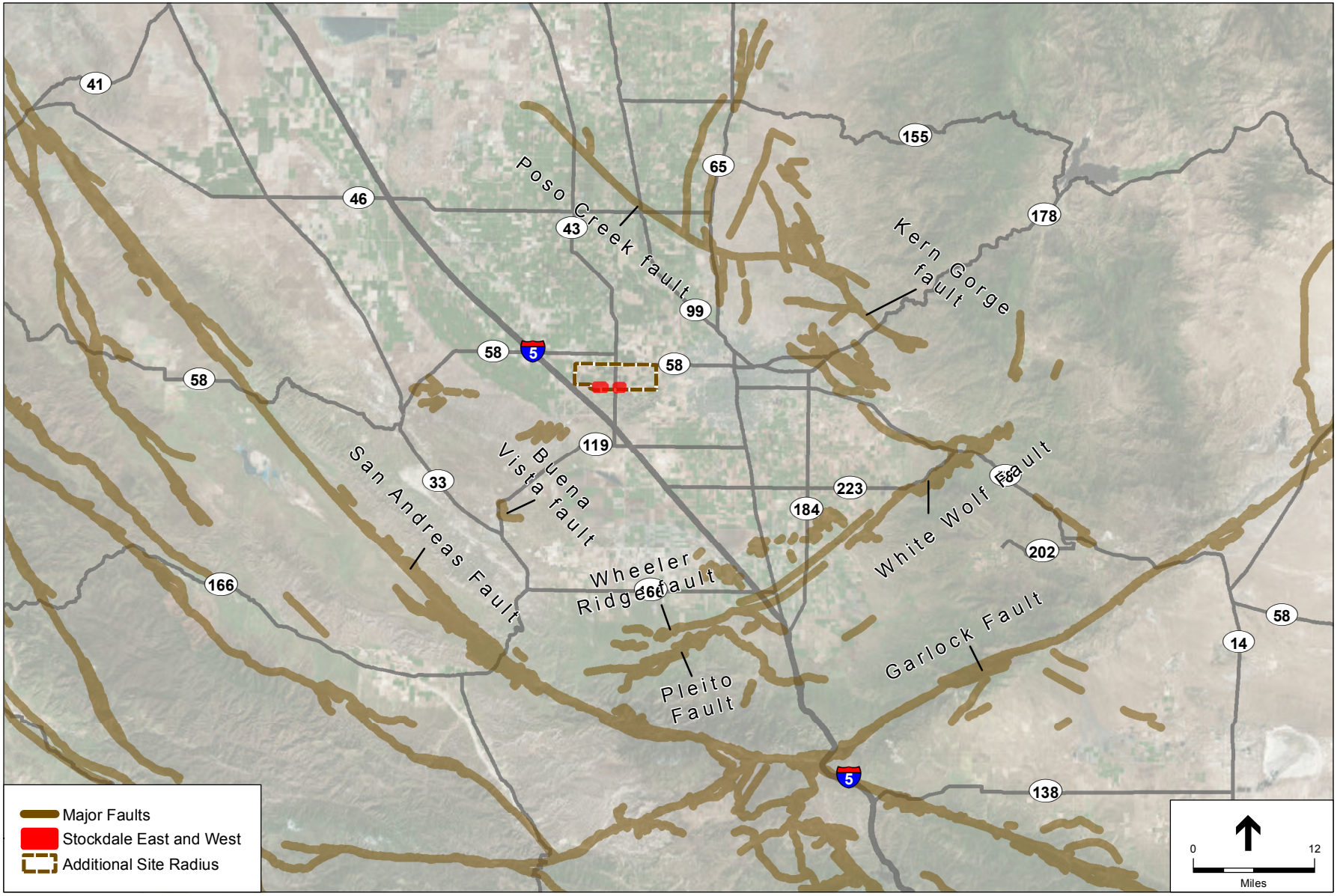
Due to the high permeability of these soils, there is very low surface runoff potential and, therefore, low susceptibility to fluvial erosion. However, each of these soil types is moderately susceptible to wind erosion when groundcover is not present. Additionally, the clay content of the Wasco fine sandy loam, the Wasco sandy loam, and the Kimberlina fine sandy loam may be moderately susceptible to shrinkage or swelling.

Regional Faults

Faults within the vicinity of the project area include the San Andreas, White Wolf, Kern Canyon, Garlock, and the Buena Vista fault as well as numerous unnamed faults and faults associated with these major faults. **Figure 3.6-2** illustrates the faults in the vicinity of the project area.

The San Andreas Fault, located approximately 25 miles southwest of the project area, is a right-lateral strike-slip fault[2] that follows the southwestern foothills of the Temblor Range within the vicinity of the project area before bending inland across the Tehachapi Mountains towards the Antelope Valley. The San Andreas is the major active fault in California and was formed due to the interaction between the Pacific Plate (to the west) and the North American Plate (to the east).

[2] "Right-lateral" movement in a fault is if you were to stand on the fault and look along its length, the right block moves toward you and the left block moves away. A "strike-slip" fault is a fault in which surfaces on opposite sides of the fault plane have moved horizontally and parallel to the strike of the fault.



SOURCE: ESRI 2013, USGS

Stockdale Integrated Banking Project . 211181

Figure 3.6-2

Regional Geologic Faults

The White Wolf Fault, located approximately 20 miles south of the project area, is a left-lateral oblique-reverse fault[3] that accommodates uplift caused by a compressional bend in the San Andreas Fault. The Kern Canyon Fault, located approximately 15 miles northeast of the site, is a right-lateral strike-slip fault similar to the San Andreas Fault and is generally regarded as a narrow, brittle fault zone.

The Garlock Fault, located approximately 40 miles southeast is a left-lateral strike-slip fault and intersects with the San Andreas Fault in Antelope Valley, California. The motion of the Garlock Fault causes deflection in the San Andreas, and deforms it slightly into a curve. The Garlock is the second largest fault in California behind the San Andreas.

The Buena Vista fault, located approximately 15 miles southwest of the site, is a relatively short segmented fault that has experienced active creep that is likely related to oil extraction.[4] All of these faults are currently active[5] and may cause significant ground shaking and surface fault rupture.

Seismicity

The proposed project is located in the highly seismic Southern California region where a large number of earthquakes are recorded each year. Thus, seismic hazards at the project sites would be consequences of ground shaking caused by events on nearby or distant, active or potentially-active faults. The proposed project is not located within a fault-rupture hazard zone as defined by the Alquist-Priolo Earthquake Fault Zoning Act (CDC, 2012). The 2007 California Building Code locates the entire region within Seismic Risk Zone 4. Areas within Zone 4 are expected to experience maximum magnitudes and damage in the event of an earthquake. In the past 100 years, there have been a number of earthquakes of magnitude 5.0 or larger reported on the active San Andreas, Garlock, and White Wolf Faults as well as unknown or unspecified faults.[6] Richter scale magnitudes of less than 4.9 generally do not result in significant damage, but magnitudes of 5.0 or greater can cause minimal to major damage to buildings depending on quality of construction and magnitude of the earthquake. **Table 3.6-1** shows historic earthquakes of magnitude 5.0 or greater in the vicinity of Kern County. The last earthquake to approach magnitude 8.0 in the vicinity of Kern County was the Fort Tejon Earthquake of 1857 about 75 miles northwest of the City of Bakersfield,, which was estimated at a magnitude 7.9 and originated from the San Andreas Fault. A magnitude 8.0 earthquake can cause serious damage in areas several hundred miles across.

3 "Left-lateral" movement in a fault is if you were to stand on the fault and look along its length, the left block moves toward you and the right block moves away. An "oblique-reverse fault" is a type of fault formed when the hanging wall fault block moves up along a fault surface relative to the footwall and its trend is oblique to the strike.

4 Fault creep is the slow continual deformation of bedrock across a fault without evidence of displacement from a single earthquake event.

5 An active fault is defined by the state of California as a fault that has had surface displacement within Holocene time (approximately the last 10,000 years). A potentially active fault is defined as a fault that has shown evidence of surface displacement during the Quaternary (last 1.6 million years), unless direct geologic evidence demonstrates inactivity for all of the Holocene or longer. This definition does not, of course, mean that faults lacking evidence of surface displacement are necessarily inactive. Sufficiently active is also used to describe a fault if there is some evidence that Holocene displacement occurred on one or more of its segments or branches (DOC, 1994).

6 Southern California Earthquake Data Center at http://www.data.scec.org, October 2013.

TABLE 3.6-1
HISTORIC EARTHQUAKES MAGNITUDE 5.0 OR GREATER IN KERN COUNTY AREA

Name	Date/Time	Fault	Location	Magnitude
Walker Pass Earthquake	March 15, 1946/5:49 am PST	Unknown	5 miles NNW of Walker Pass, CA	6.0
Kern County Earthquake	July 21, 1952/4:52 am PST	White Wolf	23 miles S of Bakersfield, CA	7.5
Parkfield Earthquake	June 27, 1966/9:26 pm PST	San Andreas	6 miles NW of Parkfield, CA	6.0
Tejon Ranch Earthquake	June 10, 1988/4:06 pm PST	Unknown	32 miles SSE of Bakersfield, CA	5.4
Mojave Earthquake	July 11, 1992/11:14 am PST	Garlock	50 miles E of Bakersfield, CA	5.7
Wheeler Ridge Earthquake	May 27, 1993/9:47 pm PST	Unknown	15 miles SSW of Bakersfield, CA	5.2
Wheeler Ridge Earthquake	April 16, 2005 / 12:18pm PDT	Unknown	26 miles SSW of Bakersfield, CA	5.2

SOURCE: Southern California Earthquake Data Center at http://www.data.scec.org, October 2013.

Seismic Hazards

Surface Fault Rupture

Seismically-induced ground rupture is defined as the physical displacement of surface deposits in response to an earthquake's seismic waves. The magnitude, sense, and nature of fault rupture can vary for different faults or even along different segments of the same fault. Ground rupture is considered more likely along active faults.

The Stockdale Properties and the Central Intake Pipeline are not within an Alquist-Priolo Fault Rupture Hazard Zone, as designated through the Alquist-Priolo Earthquake Fault Zoning Act, and no mapped active faults are known to pass through the immediate project vicinity (Hart, 1994). Therefore, the risk of ground rupture at the sites is considered very low.

Ground Shaking

Areas most susceptible to intense ground shaking are those located closest to an earthquake-generating fault, and areas underlain by thick, loosely unconsolidated and saturated sediments. Ground movement during an earthquake can vary depending on the overall magnitude, distance to the fault, focus of earthquake energy, and type of geologic material.

While the earthquake magnitude is a measure of the energy released in an earthquake, intensity is a measure of the ground shaking effects at a particular location. Areas underlain by bedrock typically experience less severe ground shaking than those underlain by loose, unconsolidated materials. Unconsolidated materials, even when located relatively distant from faults, can intensify ground shaking. The Modified Mercalli Intensity (MMI) scale (**Table 3.6-2**) is commonly used to measure earthquake effects due to ground shaking. The MMI values range from I (earthquake not felt) to XII (damage nearly total), and intensities ranging from IV to X could cause moderate to significant structural damage.

TABLE 3.6-2
MODIFIED MERCALLI INTENSITY SCALE

Intensity Value	Intensity Description
I	Not felt except by a very few persons under especially favorable circumstances.
II	Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.
III	Felt quite noticeably indoors, especially on upper floors of buildings, but many persons do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibration similar to a passing of a truck.
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 motorcars rock noticeably.
V	Felt by nearly everyone, many awakened. Some dishes, windows, etc., broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.
VI	Felt by all, many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.
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 motorcars.
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 motorcars disturbed.
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 conspicuously. Underground pipes broken.
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 (slopped) over banks.
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.
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.

SOURCE: Bolt, 1988.

Ground shaking intensity in the project area is anticipated to be approximately equivalent to MMI VII to IX (strong to very strong) ground shaking. This MMI range is assumed because MMI for the Bakersfield area was modeled for the magnitude 7.9 Fort Tejon Earthquake of 1857 (the largest recorded earthquake in the area) and this range is what the model produced (Cal OES, 2013). Ground shaking of this range of intensity would likely cause some degree of damage to project facilities; however, well-designed structures are not anticipated to experience serious damage or collapse.

Liquefaction

Liquefaction is a phenomenon whereby unconsolidated and/or near saturated soils lose cohesion and are converted to a fluid state as a result of severe vibratory motion. The relatively rapid loss of soil shear strength during strong earthquake shaking results in the temporary fluid-like

behavior of the soil. Soil liquefaction causes ground failure that can damage roads, pipelines, buildings with shallow foundations, and levees. Liquefaction can occur in areas characterized by water-saturated, cohesionless, and granular materials at depths less than 40 feet, especially in areas with a shallow water table. Saturated unconsolidated alluvium with earthquake intensities greater than VII on the MMI Scale may be susceptible. Detailed liquefaction mapping does not exist within Kern County (KCFD, 2012). According to the Kern County Fire Department Office of Emergency Services, the project area is not in an area with a shallow water table and is not likely to be susceptible to liquefaction (KCFD, 2012). However, the groundwater table does fluctuate greatly in association with banking operations. During years of high groundwater recharge efforts, the groundwater table could potentially be shallow enough to present a liquefaction hazard, although there has been no evidence of previous liquefaction (KCFD, 2012).

Seismically Induced Landslide

A landslide is a mass of rock, soil, and debris displaced down-slope by sliding, flowing, or falling. The susceptibility of land (slope) failure is dependent on the slope and geology as well as the amount of rainfall, excavation, or seismic activities. Factors that decrease resistance to movement in a slope include pore water pressure, material changes, and structure. Removing the lower portion (the toe) of a slope decreases or eliminates the support that opposes lateral motion in a slope. Shaking during an earthquake may lead materials in a slope to lose cohesion and collapse. Due to the relatively level topography in the vicinity of the project sites, there is between a one and ten percent chance of occurrence (KCFD, 2012).

Geologic Hazards

Erosion

Erosion is the detachment and movement of soil materials through natural processes or human activities. The detachment of soil particles can be initiated through the suspension of material by wind or water. Silt-sized particles are the most easily removed particles, due to their size and low cohesiveness. Erosion problems in Kern County are prevalent on steep slopes, alluvial fans, earthquake fault zones, and urban drainage systems (KCFD, 2012). In general, the project sites do not contain steep slopes or alluvial fan soils and are not located near an earthquake fault zone. The project sites are located near urban drainage systems and contain soils with a moderate to slight potential for erosion. Therefore, the project sites could be susceptible to wind erosion.

Expansive Soils

Expansive soils possess a shrink-swell characteristic[7] that can result in structural damage over a long period of time. Expansive soils are largely comprised of silicate clays, which expand in volume when water is absorbed and shrink when dried. Highly expansive soils can cause damage to foundations and roads. There is currently no comprehensive catalog of expansive soils in Kern County, but problems with swelling soils could occur if not properly identified and mitigated prior to construction (KCFD, 2012).

[7] "Shrink-swell" is the cyclical expansion and contraction that occurs in fine-grained clay sediments from wetting and drying. Structures located on soils with this characteristic may be damaged over a long period of time, usually as the result of inadequate foundation engineering.

Land Subsidence/Fissures

Subsidence is occurring in the San Joaquin Valley. Subsidence from groundwater withdrawal affects the San Joaquin Valley, particularly in the northern portion of the Valley near El Nido, in the central portion of the Valley near Tulare and Kettleman City, and the southwest end of the Valley in the vicinity of the Buena Vista Lake Bed (KCFD, 2012; Groundwater Voices Coalition; 2014). Land subsidence can occur as a result of groundwater extraction where underlying soils can compact when water is removed. The extraction of mineral or oil resources can also result in subsidence. The usual remedial action for land subsidence is that of raising the water table by injecting water or by reducing groundwater pumping (KCFD, 2012). This increases the fluid pressure in the aquifer and, in most instances, subsidence decreases or stops after a period of time. Permanent subsidence can result due to inelastic compaction, which occurs when the structure of the substrate is compromised during compaction such that it is unable to expand to its original thickness even when groundwater levels rise again. According to the County General Plan Land Subsidence map, land subsidence has occurred in the project area (Kern County Planning Department, 2009). A recent assessment determined that total subsidence during 2007 to 2011 was between 0.0 to 0.5 feet throughout the Central Valley, including the project area (Groundwater Voices Coalition, 2014). The Kern Fan Monitoring Committee uses extensometers to monitor subsidence in the project area. Between 1994 and 2013, water surface elevation has increased by 0.7736 feet, based on the extensometer at State Well 30S/25E-16L005M just south of the project area (DWR SCRO, 2013). This increase denotes swelling rather than subsidence in the project area.

Hyrdocompaction

Hydrocompaction is a form of land subsidence that occurs when unsaturated soils, low density fine grained soils with small pores and voids, are subjected to increased moisture content. The moisture alters the cementation structure of the normally arid soils. The rearrangement of the soil structure causes collapse and differential settlement to occur under relatively light loading. To avoid hydrocompaction, contractors have hydrocompacted soils prior construction. For example, soils in many areas crossed by the California Aqueduct were intentionally hydrocompacted before aqueduct construction to avoid subsidence problems and subsequent subsidence due to hydrocompaction in these areas has been minimal.[8] The project sites could be susceptible to hydrocompaction.

3.6.2 Regulatory Setting

State

California Building Code (CBC)

The California Building Code (CBC) has been codified in the California Code of Regulations (CCR) as Title 24, Part 2. 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 purpose of the CBC is to establish minimum standards to safeguard the public health, safety and

[8] *Ibid.*

general welfare through structural strength, means of egress facilities, and general stability by regulating and controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all building and structures within its jurisdiction. The CBC is based on the International Building Code. The 2010 CBC is based on the 2009 International Building Code (IBC) published by the International Code Conference. In addition, the CBC contains necessary California amendments which are based on reference standards obtained from various technical committees and organizations such as the American Society of Civil Engineers (ASCE), the American Institute of Steel Construction (AISC), and the American Concrete Institute (ACI). ASCE Minimum Design Standards 7-05 provides requirements for general structural design and includes means for determining earthquake loads as well as other loads (flood, snow, wind, etc.) for inclusion into 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 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 (very high seismic vulnerability and near a major fault). Design specifications are then determined according to the SDC.

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.

Local

Kern County Code

The Kern County Code of Ordinances would require issuance of a well drilling permit prior to construction of proposed project wells (Kern County Code, Title 14, Chapter 14.08). Other permits, such as grading, construction, and building permits would not be required because the proposed water facilities are considered exempt under Government Code Section 53091.

Kern County General Plan

The Stockdale Properties and the Central Intake Pipeline are located within the area governed by the *Kern County General Plan* (County General Plan) (Kern County Planning Department, 2004a). Within the Land Use, Conservation, and Open Space and Safety Elements of the County

General Plan, there is a goal, policies, and implementation measures that are applicable to the proposed project regarding geology and soils:

Safety Element, Induced Surface Rupture, Ground Shaking, and Ground Failure Section

Implementation Measure B: Require geological and soils engineering investigations in identified significant geologic hazard areas in accordance with the Kern County Code of Building Regulations.

Implementation Measure C: The fault zones designated in the Kern County Seismic Hazard Atlas should be considered significant geologic hazard areas. Proper precautions should be instituted to reduce seismic hazard, whenever possible in accordance with State and County regulations.

Implementation Measure H: Require that plans and permits for installation of major lifeline components such as highways, utilities, petroleum or chemical pipelines to incorporate design features to accommodate potential fault movement in areas of active faults without prolonged disruption of essential service or threat to health and safety.

Safety Element, Landslide, Subsidence, Seiche, and Liquefaction Section

Policy 1: Determine the liquefaction potential at sites in areas of shallow groundwater (Map Code 2.3) prior to discretionary development and determine specific mitigation to be incorporated into the foundation design, as necessary, to prevent or reduce damage from liquefaction in an earthquake.

Policy 2: Route major lifeline installations around potential areas of liquefaction or otherwise protect them against significant damage from liquefaction in an earthquake.

Implementation Measure D: Discretionary actions will be required to address and mitigate impacts from inundation, land subsidence, landslides, high groundwater areas, liquefaction and seismic events through the CEQA process.

Bakersfield General Plan

The project site is also located within the area governed by the *Metropolitan Bakersfield General Plan* (Bakersfield General Plan) (City of Bakersfield and Kern County, 2002). Within the Safety Element of the Bakersfield General Plan, there are goals, policies, and implementation measures that are applicable to the proposed project regarding geology and soils:

Goal 1: Substantially reduce the level of death, injury, property damage, economic and social dislocation and disruption of vital services that would result from earthquake damage.

Goal 5: Protect essential lifelines and prevent casualties and major social and economic disruption due to liquefaction in an earthquake.

Policy 1: Ensure that earthquake survival and efficient post-disaster functions are a primary objective in the siting, design, and construction standards for discretionary essential facilities or the expansion of such facilities.

Policy 13: Determine the liquefaction potential at sites in areas of high groundwater prior to the development and determine specific mitigation to be incorporated into the foundation design, as necessary to prevent or reduce damage from liquefaction in an earthquake.

Policy 14: Route major lifeline installations around potential liquefaction areas or otherwise protect them against significant damage from liquefaction in an earthquake.

Implementation Measure 2: Require detailed studied for ground shaking characteristics, liquefaction potential, dam failure inundation and flooding potential, and fault rupture potential, as background to the design process for critical facilities under the city and county discretionary approval.

Implementation Measure 3: Require structures that are within the plan area and are subject to Building Department review to adhere to the most current seismic standards adopted as part of the Uniform Building Code.

3.6.3 Impact Assessment

Thresholds of Significance

The following criteria from Appendix G of the *CEQA Guidelines* are used as thresholds of significance to determine the impacts of the proposed project as related to geology, soils, and seismicity. The proposed project would have a significant impact if it would:

1. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
    a. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault (Refer to Division of Mines and Geology Special Publication 42.);
    b. Strong seismic ground shaking;
    c. Seismic-related ground failure, including liquefaction; and/or
    d. Landslides.
2. Result in substantial soil erosion or the loss of topsoil.
3. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse.
4. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property.

5. 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

Effects Found Not to be Significant

Threshold 1a. Fault Rupture

The faults most susceptible to earthquake rupture are active faults, which are faults that have experienced surface displacement within the last 11,000 years. There are no active faults that cross the project site properties, and the nearest active fault is more than 15 miles away. Therefore, the potential for fault rupture to affect the proposed project is very low. No impact would occur.

Threshold 1d. Landslides and Lateral Spreading

The proposed project is located within an area that is relatively flat with very little topographic relief. Therefore, there is very little potential for landslides or lateral spreading. No impact would occur.

Threshold 4. Expansive Soils

The proposed project does not include the construction of any permanent structures that would require a foundation that could be adversely affected by surface soils with expansive properties. Therefore, there would be no impact associated with expansive soils.

Threshold 5. Septic Tanks

The proposed project does not involve the construction or use of septic tanks or alternative wastewater disposal systems. Therefore, there would be no impacts related to soils supporting such structures.

Impacts and Mitigation Measures

Threshold 1. Seismic Hazard

Impact GEO-1: The proposed project could expose new structures to adverse effects related to strong seismic ground shaking, ground failure, and liquefaction.

The project vicinity has experienced and would likely continue to experience strong seismic ground shaking due to its proximity to a number of active faults, including the San Andreas Fault and the Garlock fault. If such an event were to occur during a time of a relatively shallow depth to groundwater or otherwise saturated soil conditions from recharge activities, the site soils could be susceptible to seismically-induced liquefaction hazards.

In the event that ground shaking caused damage to a recharge basin and/or conveyance structure, released water would likely infiltrate into the permeable soils that comprise the project sites. The recharge basins would be constructed primarily below grade with berms constructed above grade, which, coupled with the relatively flat topography, would hinder movement of water offsite. The

Central Intake Pipeline would be constructed completely below ground. Therefore, the potential risk of loss, injury, or death from strong seismic shaking is considered low.

At the Stockdale Properties, shallow depth to groundwater is not expected to cause liquefaction during seismic events because the proposed project includes requirements to monitor shallow groundwater levels and make operational changes to avoid shallow depth to groundwater as part of **Mitigation Measure HYDRO-2** (see Chapter 3.9).

Impact Determination

Potential adverse effects associated with ground shaking and seismically-induced liquefaction include damage to proposed water-bearing structures such as recharge basins and conveyance structures. Given the project design features and relatively flat topography, the potential for water to move offsite is low. Given the limited improvements associated with the proposed project, the potential risk of loss, injury or death is considered low and any structural damage would be reparable. Plus, Mitigation Measure HYDRO-2 would monitor shallow groundwater and minimize conditions that would contribute to potential liquefaction hazards. Impacts are considered less than significant with mitigation.

Significance Conclusion

Less than Significant with Mitigation.

Mitigation Measures

Implement **Mitigation Measure HYDRO-2** (see Chapter 3.9).

Threshold 2. Soil Erosion

Impact GEO-2: The proposed project could result in soil erosion or the loss of topsoil.

Construction activities at Stockdale West would require drilling activities for the construction of recovery wells as well as construction of the Stockdale West Turnout. Construction activities at Stockdale East and the third Stockdale project site would include site clearing and demolition; excavation and backfill; construction of basins, conveyance channels and pipelines, a pump station and CVC turnout; and recovery facilities; and site restoration. Grading activities associated with the construction of the recharge basins would involve earthmoving, excavation, stockpiling, and grading; all of which could expose soils to erosion processes. The Central Intake Pipeline would be constructed using typical open trench construction methods, with the exception of crossing Stockdale Highway and the Southern Pacific Railroad, where jack and bore methods would be used to tunnel under and avoid disruption of surface features. Excavation up to 12 feet would be required; and excavated soils would be redistributed and utilized to cover the embedded pipeline, and to create berms around the recharge basins, to the extent feasible. The extent of erosion that would occur would vary depending on slope steepness/stability, vegetation/cover, concentration of runoff, and weather conditions.

To prevent water and wind erosion during the construction period, a Storm Water Pollution Prevention Plan (SWPPP) would be developed and implemented for the proposed project as required for all projects that disturb more than one acre. (See Chapter 3.9, Hydrology and Water Quality for more information about the SWPPP.) The SWPPP would specify BMPs to prevent construction pollutants, including eroded soils (such as topsoil), from moving off-site and provide erosion control measures to protect the topsoil. **Mitigation Measure HYDRO-1** in Chapter 3.9 requires establishment of an erosion control perimeter around active construction and contractor layout areas. The recharge basins and supply channels would be designed in an effort to balance earthwork on site in which all excavated soils would be redistributed and utilized to construct the project facilities. Topsoil materials would be stripped from the ground surface and used for construction of the earthen berms of the recharge ponds. Mitigation Measure HYDRO-1 also requires stockpiled soils to be watered and/or covered to prevent loss due to wind erosion as part of the SWPPP. As a result of these efforts, loss of topsoil and substantial soil erosion during the construction period are not anticipated.

During operation of the groundwater recharge basins, the recharge basins would contain water, which would inhibit erosion; during periods of non-recharge, the recharge basins would be subject to wind erosion. Plant cover at the project site would minimize wind erosion. Operation of the Central Intake Pipeline would not contribute to wind erosion since the pipeline would be underground running along the edge of Stockdale East and then primarily beneath an existing dirt road between existing agricultural parcels. The dirt road is already denuded of vegetation and would be restored back to existing conditions, resulting in no change in erosion potential.

Impact Determination

To minimize soil erosion and loss of topsoil during construction, Rosedale would be required to develop and implement a SWPPP, which would provide water and wind erosion control measures to protect the topsoil, including the BMPs required by Mitigation Measure HYDRO-1. During project operation, the groundwater recharge basins would contain water, which would inhibit erosion, and plant cover would minimize wind erosion during non-recharge periods. With implementation of the SWPPP and Mitigation Measure HYDRO-1, and the operational design of the proposed project, impacts related to soil erosion and topsoil loss would be less than significant with mitigation.

Significance Conclusion

Less than Significant with Mitigation.

Mitigation Measures

Implement **Mitigation Measure HYDRO-1** (see Chapter 3.9).

Threshold 3. Unstable Soils

Impact GEO-3: Operation of the proposed project could affect groundwater levels and result in on-site or off-site subsidence from compaction.

Recent studies estimate approximately 0.0 to 0.5 feet of subsidence has occurred between 2007 to 2011 throughout the Central Valley, including in the project area (Groundwater Voices Coalition, 2014). Such widespread land subsidence in the Central Valley is primarily caused by compaction (USGS, 1995). The western and southern margins of the San Joaquin Valley have historically been impacted by land subsidence due to hydrocompaction (USGS, 1995). Hydrocompaction occurs when formerly unsaturated soils become saturated, which allows the soil particles to reorient into a more compact form (USGS, 1995). However, subsidence in the rest of the San Joaquin Valley is primarily associated with long-term withdrawal of groundwater in excess of recharge (USGS, 1995) particularly when withdrawal occurs within fine-grained sediments such as silts and clays. Extraction of groundwater from clay beds reduces pore pressure in the clay, and the weight of overlying sediments compact the clay. Compaction tends to happen more readily when wells are open only to the confined part of the aquifer system than when they are open to the shallow water-table aquifer as well. There appears to be no uniform confining layer beneath the proposed project sites. As described in Chapter 3.9, the hydrogeology of the Kern Fan region is characterized by an upper unconfined aquifer that reaches to a depth of approximately 200 to 400 feet and a lower semi-confined aquifer that extends to a depth between approximately 500 to 750 feet (THC, 2015).

In addition, the proposed project is a groundwater banking project that would require water to be recharged prior to extraction. Groundwater banking programs benefit water levels in the local aquifer because the amount of water available for recovery is less than the amount recharged; this difference can raise groundwater levels. The proposed project would be integrated with Rosedale's Conjunctive Use Program, which has served to correct for declining groundwater levels, one of the primary causes of compaction and subsidence, and therefore has served to mitigate additional subsidence to some degree. The proposed project would provide additional recharge capacity in excess of recovery and as such should not cause additional subsidence relative to existing conditions.

Impact Determination

The project area does not have a history of substantial subsidence or hydrocompaction relative to that which is occurring throughout the Central Valley. The proposed project would not extract any groundwater beyond what has been recharged into the groundwater table, and therefore, the proposed project would not change the existing conditions associated with subsidence due to groundwater extraction. Impacts would be less than significant, and no mitigation is required.

Significance Conclusion

Less than Significant.

Mitigation Measures

None required.

References – Geology, Soils, and Seismicity

California Department of Conservation, 2012. *Information Warehouse.* Accessed at http://www.quake.ca.gov/gmaps/WH/regulatorymaps.htm.

California Department of Water Resources (DWR), South Central Region Office (SCRO), 2013. Kern Water Bank Extensometer, State Well Number 30S25E16L005M, Monthly data summaries for June 1993-May 2013.

California Geological Survey (CGS), California Geomorphic Provinces, Note 36, December, 2002. Accessed at http://www.conservation.ca.gov/cgs/information/publications/cgs_notes/note_36/Documents/note_36.pdf.

California Office of Emergency Services (Cal OES), 2013. *California Multi-Hazard Mitigation Plan*.

Groundwater Voices Coalition, 2014. *Land Subsidence from Groundwater Use in the San Joaquin Valley*. Commissioned by the California Water Foundation. Prepared by Luhdorff & Scalmanini Consulting Engineers, Borchers and Carpenter, July 24, 2014.

Hart, E. W., Fault-Rupture Hazard Zones in California: Alquist-Priolo Special Studies Zones Act of 1972 with Index to Special Studies Zones Maps.

Kern County Fire Department (KCFD), 2012. *Kern Multi Jurisdiction Hazard Mitigation Plan, Comprehensive Update.*

Kern County Planning Department, 2009. *Kern County General Plan Safety Element.*

Kleinfelder West, Inc., 2010. *Irvine Ranch Water District Grimmway Property, Kern County, CA Property Assessment Report*.

RAM Environmental Engineering Services, Inc., 2009. *Rosedale Rio Bravo Water Storage District Phase I Environmental Site Assessment (ESA-1)*.

Southern California Earthquake Data Center, 2013. *Significant Earthquakes and Faults*. Accessed at http://www.data.scec.org.

Thomas Harder & Co. (THC), 2015. *Draft Proposed Stockdale Integrated Banking Project – Analysis of Potential Groundwater Level Changes from Recharge and Recovery at the Stockdale West and Stockdale East Facilities*. Prepared for Rosedale-Rio Bravo Water Storage District and Irvine Ranch Water District. January 23, 2015.

U.S. Geological Survey (USGS), 1995, *Ground Water Atlas of the United States – California Nevada, HA 730-B.* Accessed at http://pubs.usgs.gov/ha/ha730/gwa.html on February 9, 2015.

3.7 Greenhouse Gas Emissions

This chapter provides an analysis of the current environmental and regulatory framework related to climate change in California. Impacts related to greenhouse gases (GHGs) and climate change are analyzed and mitigation measures are provided for any potentially significant impacts.

3.7.1 Environmental Setting

Climate Change Overview

Various gases in the earth's atmosphere, classified as GHGs, play a critical role in determining its surface temperature. Solar radiation enters earth's atmosphere from space, and a portion of the radiation is absorbed by the earth's surface. Earth re-radiates this energy back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation. GHGs, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation (that otherwise would have escaped back into space) is now retained in the atmosphere, and results in a warming of the atmosphere. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate on earth. Without the greenhouse effect, the earth would not be able to support life as we know it.

Prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Much of the scientific literature suggests that human-caused emissions of these GHGs in excess of natural ambient concentrations are responsible for intensifying the greenhouse effect and have led to a trend of unnatural warming of earth's climate, known as global climate change or global warming. While there is some debate regarding this issue, it is unlikely that global climate change of the past 50 years can be explained without contribution from human activities (IPCC, 2007).

Climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern. Whereas pollutants with localized air quality effects have relatively short atmospheric lifetimes (about one day), GHGs have long atmospheric lifetimes (one year to several thousand years). GHGs persist in the atmosphere for long enough time periods to be dispersed around the globe. Although the exact lifetime of any particular GHG molecule is dependent on multiple variables and cannot be pinpointed, it is understood that more CO_2 is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration.

As discussed previously, impacts of GHGs are borne globally, as opposed to localized air quality effects of criteria air pollutants and toxic air contaminants. While the quantity of GHGs that it takes to ultimately result in climate change is not precisely known, it is clear that no single project would measurably contribute to a noticeable incremental change in the global average temperature, or to global, local, or micro climates. Thus, from the standpoint of CEQA, GHG impacts to global climate change are inherently cumulative.

Greenhouse Gas Emission Sources

According to much of the scientific literature on this topic, emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the transportation, industrial/manufacturing, utility, residential, commercial, and agricultural sectors (ARB, 2014a). In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation. Emissions of CO_2 are byproducts of fossil fuel combustion. Methane, a highly potent GHG, results from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions) and is largely associated with agricultural practices and landfills. Nitrous oxide is also largely attributable to agricultural practices and soil management. Carbon dioxide sinks, or reservoirs, include vegetation and the ocean, which absorb CO_2 through sequestration and dissolution, respectively, two of the most common processes of CO_2 sequestration.

California produced approximately 459 million gross metric tons of CO_2 equivalent (CO_2e) in 2012 (ARB, 2014a). CO_2e is a measurement used to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. Expressing emissions in CO_2e takes the contributions to the greenhouse effect of all GHG emissions and converts them to the equivalent effect that would occur if only CO_2 were being emitted. This measurement, known as the global warming potential (GWP) of a GHG, is dependent on the lifetime, or persistence, of the gas molecule in the atmosphere.

Combustion of fossil fuel in the transportation sector was the single largest source of California's GHG emissions in 2012, accounting for 36 percent of total GHG emissions in the state. This sector was followed by the electric power sector (including both in-state and out-of-state sources) (21 percent) and the industrial sector (19 percent) (ARB, 2014a).

3.7.2 Regulatory Setting

Federal

Clean Air Act and the United States Environmental Protection Agency

The federal Clean Air Act (CAA) requires the United States Environmental Protection Agency (EPA) to define national ambient air quality standards to protect public health and welfare in the U.S. The CAA does not specifically regulate GHG emissions; however, on April 2, 2007, the U.S. Supreme Court in *Massachusetts v. U.S. Environmental Protection Agency*, determined that GHGs are pollutants that can be regulated under the CAA. Currently, there are no federal regulations that establish ambient air quality standards for GHGs.

On December 7, 2009, EPA adopted its Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under the CAA (Endangerment Finding). The Endangerment Finding is based on Section 202(a) of the CAA, which states that the administrator (of EPA) should regulate and develop standards for "emission[s] of air pollution from any class or classes of new motor vehicles or new motor vehicle engines, which in [its] judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare." The rule addresses Section 202(a) in two distinct findings. The first addresses whether the concentrations of the six

key GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) in the atmosphere threaten the public health and welfare of current and future generations. The second addresses whether the combined emissions of GHGs from new motor vehicles and motor vehicle engines contribute to atmospheric concentrations of GHGs and, therefore, contribute to the threat of climate change.

The Administrator of EPA found that atmospheric concentrations of GHGs endanger the public health and welfare within the meaning of Section 202(a) of the CAA. The evidence supporting this finding consists of human activity resulting in "high atmospheric levels" of GHG emissions, which are likely responsible for increases in average temperatures and other climatic changes. Furthermore, the observed and projected results of climate change (e.g., higher likelihood of heat waves, wildfires, droughts, sea level rise, and higher intensity storms) are a threat to the public health and welfare. Therefore, GHGs were found to endanger the public health and welfare of current and future generations.

The Administrator of EPA also found that GHG emissions from new motor vehicles and motor vehicle engines are contributing to air pollution, which is endangering public health and welfare. EPA's final findings respond to the 2007 U.S. Supreme Court decision that GHGs fit within the CAA definition of air pollutants. The findings do not in and of themselves impose any emission reduction requirements but, rather, allow EPA to finalize the GHG standards proposed earlier in 2009 for new light-duty vehicles as part of the joint rulemaking with the Department of Transportation. These standards would are described in detail in the next section.

Specific GHG regulations that the EPA has adopted to-date are as follows:

40 CFR Part 98. Mandatory Reporting of Greenhouse Gases Rule. This rule requires mandatory reporting of GHG emissions for facilities that emit more than 25,000 metric tons of CO_2e emissions per year. Additionally, reporting of emissions is required for owners of SF_6- and PFC-insulated equipment when the total nameplate capacity of these insulating gases is above 17,280 pounds.

40 CFR Part 52. Proposed Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule. This rule sets GHG emissions thresholds that define when permits under the EPA's New Source Review Prevention Significant Deterioration (PSD) and Title V Operating Permit programs would be required for new and existing industrial facilities. The first step of the EPA's tailoring rule, which took effect Jan. 2, 2011, required sources that were already subject to PSD requirements to obtain permits for their GHG emissions if they emit 75,000 tons of CO_2e per year. Beginning July 1, 2011, the second phase applied permitting requirements to all stationary sources with GHG emissions of at least 100,000 tons of CO_2e annually or that made modifications increasing their emissions by at least 75,000 tons per year. The requirements applied to sources even if they were not previously subject to permitting for other pollutants.

State

California Air Resources Board

The California Air Resources Board (ARB) is the agency responsible for coordination and oversight of state and local air pollution control programs in California. Various statewide and

local initiatives to reduce the State's contribution to GHG emissions have raised awareness that, even though the various contributors to and consequences of global climate change are not yet fully understood, global climate change is under way, and there is a real potential for severe adverse environmental, social, and economic effects in the long term. Because every nation emits GHGs and therefore makes an incremental cumulative contribution to global climate change, cooperation on a global scale will be required to reduce the rate of GHG emissions to a level that can help to slow or stop the human-caused increase in average global temperatures and associated changes in climatic conditions.

There are currently no state regulations in California that establish ambient air quality standards for GHGs. However, California has passed laws directing ARB to develop actions to reduce GHG emissions, and several state legislative actions related to climate change and GHG emissions have come into play in the past decade.

Assembly Bill 1493

In 2002, then-Governor Gray Davis signed Assembly Bill (AB) 1493. AB 1493 requires that ARB develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of GHGs emitted by passenger vehicles and light-duty trucks and other vehicles determined by ARB to be vehicles whose primary use is noncommercial personal transportation in the State."

To meet the requirements of AB 1493, in 2004, ARB approved amendments to the California Code of Regulations (CCR) adding GHG emissions standards to California's existing standards for motor vehicle emissions. Amendments to CCR Title 13, Sections 1900 and 1961 (13 CCR 1900, 1961), and adoption of Section 1961.1 (13 CCR 1961.1) require automobile manufacturers to meet fleet-average GHG emission limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger vehicle weight classes (i.e., any medium-duty vehicle with a gross vehicle weight rating less than 10,000 pounds that is designed primarily for the transportation of persons), beginning with the 2009 model year. For passenger cars and light-duty trucks with a loaded vehicle weight (LVW) of 3,750 pounds or less, the GHG emission limits for the 2016 model year are approximately 37 percent lower than the limits for the first year of the regulations, the 2009 model year. For light-duty trucks with LVW of 3,751 pounds to gross vehicle weight (GVW) of 8,500 pounds, as well as medium-duty passenger vehicles, GHG emissions would be reduced approximately 24 percent between 2009 and 2016.

On September 15, 2009, EPA and the Department of Transportation's National Highway Safety Administration (NHTSA) proposed a national program to reduce GHG emissions and improve fuel economy for new cars and trucks sold in the United States. The combined EPA and NHTSA standards that make up the proposed national program would apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. They require these vehicles to meet an estimated combined average emissions level of 250 grams of CO_2 per mile, equivalent to 35.5 miles per gallon (mpg). Under the proposed national program, automobile manufacturers would be able to build a single light-duty national fleet that satisfies all requirements under both the national program and the standards of California and other states, while ensuring that consumers still have a full range of vehicle choices. In order to promote the adoption of the national program, ARB has adopted amendments to the GHG emissions standards

for new passenger vehicles from 2009 through 2016. In December 2011, NHTSA and EPA issued a joint proposal to extend the National Program to further improve fuel economy and reduce GHG emissions for passenger and light-duty vehicles for model years 2017 to 2025. This would be accomplished through new proposed Corporate Average Fuel Economy (CAFE) standards by NHTSA and new GHG emission standards by EPA. The proposed CAFE standards are projected to require, on an average industry-fleet-wide basis for cars and trucks combined, 40.1 mpg in model year 2021, and 49.6 mpg in model year 2025. EPA's proposed GHG standards, which would be harmonized with NHTSA's CAFE standards, are projected to require 163 grams/mile (54.5 mpg) of CO_2 in model year 2025. All mobile sources, including trips generated by the proposed project, would be required to comply with these regulations as they are phased in.

Executive Order S-3-05

Executive Order S-03-05, which was signed by Governor Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the Executive Order established total GHG emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

The Executive Order directed the Secretary of California Environmental Protection Agency (CalEPA) to coordinate a multi-agency effort to reduce GHG emissions to the target levels. The Secretary will also submit biannual reports to the Governor and State Legislature describing progress made toward reaching the emission targets, impacts of global warming on California's resources, and mitigation and adaptation plans to combat these impacts. To comply with the Executive Order, the Secretary of CalEPA created the California Climate Action Team (CCAT) made up of members from various state agencies and commissions. CCAT released its first report in March 2006. The report proposed to achieve the targets by building on voluntary actions of California businesses, local government, and community actions, as well as through State incentive and regulatory programs.

Assembly Bill 32 (California Global Warming Solutions Act of 2006)

In September 2006, Governor Arnold Schwarzenegger signed the California Global Warming Solutions Act (AB 32; California Health and Safety Code Division 25.5, Sections 38500 - 38599). AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and establishes a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. This reduction will be accomplished by enforcing a statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs ARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then ARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

AB 32 requires ARB to adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrived at the cap; institute a schedule to meet the emissions cap; and

develop tracking, reporting, and enforcement mechanisms to ensure that the state reduces GHG emissions enough to meet the cap. AB 32 also includes guidance on instituting emissions reductions in an economically efficient manner, along with conditions to ensure that businesses and consumers are not unfairly affected by the reductions. According to ARB's *Climate Change Scoping Plan* (ARB, 2008), the 2020 target of 427 million metric tons (MMT) of CO_2e requires the reduction of 169 $MMTCO_2e$, or approximately 28.4 percent, from the state's projected 2020 business-as-usual (BAU) emissions level of 596 $MMTCO_2e$. However, ARB has discretionary authority to seek greater reductions in more significant and growing GHG sectors, such as transportation, as compared to other sectors that are not anticipated to significantly increase emissions. In August 2011, the *Scoping Plan* was re-approved by the Board and includes the *Final Supplement to the Scoping Plan Functional Equivalent Document* (ARB, 2011). This document includes expanded analysis of project alternatives as well as updates the 2020 emission projections in light of the current economic forecasts. Considering the updated 2020 BAU estimate of 507 $MMTCO_2e$, a 16 percent reduction below the estimated BAU levels would be necessary to return to 1990 levels by 2020. The document also excludes one measure identified in the 2008 *Scoping Plan* that has been adopted and one measure that is no longer under consideration by ARB (ARB, 2011).

As required by AB 32, the Scoping Plan must be updated at least every five years to evaluate the mix of AB 32 policies to ensure that California is on track to meet the targets set out in the legislation. As such, a draft Update to the initial Scoping Plan was developed by ARB in collaboration with the CCAT and was presented to ARB's Board for discussion at its February 20, 2014 meeting. The draft Update builds upon the initial Scoping Plan with new strategies and expanded measures, and identifies opportunities to leverage existing and new funds to drive GHG emission reductions through strategic planning and targeted program investments. The first update to the AB 32 Scoping Plan was approved on May 22, 2014 by ARB (ARB, 2014b).

Senate Bill 1368

SB 1368 (Perata, Chapter 598, Statutes of 2006) is the companion bill of AB 32 and was signed by Governor Schwarzenegger in September 2006. SB 1368 required the California Public Utilities Commission (CPUC) to establish a GHG emission performance standard for baseload generation from investor-owned utilities. CPUC adopted a GHG Emissions Performance Standard in January 2007. The California Energy Commission (CEC) adopted consistent regulations for implementing and enforcing SB 1368 for the state's publicly-owned utilities in August 2007. These standards cannot exceed the GHG emission rate from a baseload combined-cycle natural gas-fired plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the CPUC and CEC.

Executive Order S-1-07

Executive Order S-1-07, which was signed by then-Governor Schwarzenegger in 2007, proclaims that the transportation sector is the main source of GHG emissions in California, generating more than 40 percent of statewide emissions. It establishes a goal to reduce the carbon intensity of transportation fuels sold in California by at least 10 percent by 2020. This order also directs ARB to determine whether this low carbon fuel standard (LCFS) could be adopted as a discrete early-action measure as part of the effort to meet the mandates in AB 32.

On April 23, 2009, ARB approved the proposed regulation to implement the LCFS. The LCFS will reduce GHG emissions from the transportation sector in California by about 16 MMT in 2020. The LCFS is designed to reduce California's dependence on petroleum, create a lasting market for clean transportation technology, and stimulate the production and use of alternative, low-carbon fuels in California. The LCFS is designed to provide a durable framework that uses market mechanisms to spur the steady introduction of lower carbon fuels. The framework establishes performance standards that fuel producers and importers must meet each year beginning in 2011. One standard is established for gasoline and the alternative fuels that can replace it. A second similar standard is set for diesel fuel and its replacements.

However, the issuance of regulations by California under the LCFS has resulted in several lawsuits that were brought on by industry trade organizations representing ethanol producers, refiners, and truckers. These lawsuits allege that California acted in violation of the U.S. Constitution because the LCFS are inherently discriminatory against commerce taking place outside of the state of California, since more carbon emissions would always result from the transportation of fuels to California from areas outside of the state when compared to the carbon emissions generated by fuel producers in California who would be able to transport their fuel over shorter distances. In addition, the lawsuit also alleged that California was making an attempt to impermissibly regulate conduct outside of the state and contended that California's LCFS should be preempted by the Renewable Fuel Standards passed on the federal level. In response, the state has indicated that the provisions found within the CCAA provide the authority for California to control air pollution and that its regulation is a permissible act of state sovereignty. Nonetheless, a federal judge issued a preliminary injunction in December 2011, that prevented California from implementing the LCFS on the grounds that California's regulations were in violation of the Commerce Clause in the United States Constitution. ARB appealed the decision and is currently allowed to enforce the LCFS while the appeal is pending. On September 18, 2013, the Ninth Circuit Court of Appeals reversed the U.S. District Court opinion that held that California's LCFS violated the dormant Commerce Clause of the U.S. Constitution.

Senate Bill 97

SB 97, signed August 2007 (Chapter 185, Statutes of 2007; PRC Sections 21083.05 and 21097), acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. The bill directed the California OPR to prepare, develop, and transmit to the California Natural Resources Agency, guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA, by July 1, 2009. The Natural Resources Agency was required to certify or adopt those guidelines by January 1, 2010. On April 13, 2009, OPR submitted to the Secretary for Natural Resources its proposed amendments to the *CEQA Guidelines* for GHG emissions, as required by SB 97. On February 16, 2010, the Office of Administrative Law approved the amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The amendments became effective on March 18, 2010.

Senate Bills 1078 and 107 and Executive Order S-14-08

SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date

to 2010. In November 2008, then-Governor Schwarzenegger signed Executive Order S-14-08, which expands the State's Renewables Energy Standard to 33 percent renewable power by 2020. In April 2011, Governor Jerry Brown signed SB 2X, that created a legislative mandate codifying the 33 percent Renewables Portfolio Standard into law.

Senate Bill 375

SB 375, signed in September 2008 (Chapter 728, Statutes of 2008), aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a sustainable communities strategy (SCS) or alternative planning strategy (APS) that will prescribe land use allocation in that MPOs regional transportation plan (RTP). ARB, in consultation with MPOs, has provided each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every eight years but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. ARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, transportation projects may not be eligible for funding programmed after January 1, 2012.

This law also extends the minimum time period for the regional housing needs allocation cycle from five years to eight years for local governments located within an MPO that meet certain requirements. City or county land use policies (including general plans) are not required to be consistent with the regional transportation plan (and associated SCS or APS). However, new provisions of CEQA would incentivize (through streamlining and other provisions) qualified projects that are consistent with an approved SCS or APS, categorized as "transit priority projects."

ARB Early Action Measures

In June 2007, ARB directed staff to pursue 37 early actions for reducing GHG emissions under AB 32 (California Health and Safety Code Division 25.5, Sections 38500 - 38599). The broad spectrum of strategies to be developed—including a LCFS, regulations for refrigerants with high global warming potential, guidance and protocols for local governments to facilitate GHG reductions, and green ports—reflects the government's responsive actions to immediately address GHGs. In addition to approving the 37 GHG reduction strategies, ARB directed staff to further evaluate early action recommendations made at the June 2007 meeting, and to report back to ARB within six months. ARB's approach suggested a desire to try to pursue greater GHG emissions reductions in California in the near-term. ARB staff evaluated all recommendations submitted by several stakeholders and several internally-generated staff ideas, and published a draft list of early action measures in September 2007. The list was expanded to 44 measures in October 2007 (ARB, 2007). The Board has also identified nine Discrete Early Action measures to date, including potential regulations affecting landfills, motor vehicle fuels, refrigerants in cars, port operations, and other sources.

ARB Climate Change Scoping Plan

On December 11, 2008, ARB adopted its Scoping Plan, which functions as a roadmap of ARB's plans to achieve GHG reductions in California required by AB 32 through subsequently enacted regulations (ARB, 2008). ARB's Scoping Plan contains the main strategies California will implement to reduce CO_2e emissions by 169 MMT, or approximately 28.4 percent, from the

state's projected 2020 emissions level of 596 MMT of CO_2e under a BAU scenario. In August 2011, the Scoping Plan was re-approved by the Board and includes the Final Supplement to the Scoping Plan Functional Equivalent Document. This document includes expanded analysis of project alternatives as well as updates the 2020 emission projections in light of the current economic forecasts. Considering the updated 2020 BAU estimate of 507 MMT CO_2e, a 16 percent reduction below the estimated BAU levels would be necessary to return to 1990 levels by 2020. The document also excludes one measure identified in the 2008 Scoping Plan that has been adopted and one measure that is no longer under consideration by ARB (ARB, 2011).

ARB's Scoping Plan (ARB, 2008) calculates 2020 BAU emissions as the emissions that would be expected to occur in the absence of any GHG reduction measures. The 2020 BAU emissions estimate was derived by projecting emissions from a past baseline year using growth factors specific to each of the different economic sectors, i.e., transportation, electrical power, commercial, residential, industrial etc. ARB used three-year average emissions, by sector, for 2002-2004 to forecast emissions to 2020. At the time ARB's Scoping Plan process was initiated, 2004 was the most recent year for which actual data was available. The measures described in ARB's *Sc*oping Plan are intended to reduce the projected 2020 BAU to 1990 levels, as required by AB 32.

ARB's Scoping Plan also breaks down the amount of GHG emissions reductions ARB recommends for each emissions sector of the state's GHG inventory. ARB's Scoping Plan calls for the largest reductions in GHG emissions to be achieved by implementing the following measures and standards:

- Improved emissions standards for light-duty vehicles (estimated reductions of 31.7 MMT CO_2e);
- The LCFS (15.0 MMT CO_2e);
- Energy efficiency measures in buildings and appliances, and the widespread development of combined heat and power systems (26.3 MMT CO_2e); and
- A renewable portfolio standard for electricity production (21.3 MMT CO_2e).

ARB has identified a GHG reduction target of 5 MMT (of the 174 MMT total) for local land use changes (Table 2 of ARB's Scoping Plan), by Implementation of Reduction Strategy T-3 regarding Regional Transportation-Related GHG Targets. Additional land use reductions may be achieved as SB 375 is implemented. ARB's Scoping Plan states that successful implementation of the plan relies on local governments' land use, planning, and urban growth decisions because local governments have primary authority to plan, zone, approve, and permit land development to accommodate population growth and the changing needs of their jurisdictions. ARB further acknowledges that decisions on how land is used will have large effects on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors. ARB's Scoping Plan does not include any direct discussion about GHG emissions generated by construction activity.

ARB's Scoping Plan expands the list of nine Discrete Early Action Measures to a list of 39 Recommended Actions contained in Appendices C and E of ARB's Scoping Plan. These measures are presented in **Table 3.7-1**.

As discussed previously, a draft Update to the initial Scoping Plan was developed by ARB in collaboration with the CCAT to address the requirement by AB 32 that the Scoping Plan be updated at least every five years. The draft Update to the initial Scoping Plan developed by ARB in collaboration with the CCAT was presented to ARB's Board for discussion at its February 20, 2014 meeting. The draft Update builds upon the initial Scoping Plan with new strategies and expanded measures, and identifies opportunities to leverage existing and new funds to drive GHG emission reductions through strategic planning and targeted program investments. The first update to the AB 32 Scoping Plan was approved on May 22, 2014 by ARB.

As part of the proposed update to the Scoping Plan, the emissions reductions required to meet the 2020 statewide GHG emissions limit were further adjusted. The primary reason for adjusting the 2020 statewide emissions limit was based on the fact that the original Scoping Plan relied on the IPCC's 1996 Second Assessment Report (SAR) to assign the GWPs of greenhouse gases. Recently, in accordance the United Nations Framework Convention on Climate Change (UNFCCC), international climate agencies have agreed to begin using the scientifically updated GWP values in the IPCC's Fourth Assessment Report (AR4) that was released in 2007. Because ARB has begun to transition to the use of the AR4 100-year GWPs in its climate change programs, ARB recalculated the Scoping Plan's 1990 GHG emissions level with the AR4 GWPs. As the recalculation resulted in 431 $MMTCO_2e$, the 2020 GHG emissions limit established in response to AB 32 is now slightly higher than the 427 $MMTCO_2e$ in the initial Scoping Plan. Considering that the proposed update also adjusted the 2020 BAU forecast of GHG emissions to 509 $MMTCO_2e$, a 15 percent reduction below the estimated BAU levels was determined to be necessary to return to 1990 levels by 2020 (ARB, 2014b).

Carbon Credits: Mandatory and Voluntary

The AB 32 Scoping Plan identifies cap-and-trade as a key strategy for helping California reduce its GHG emissions. A cap-and-trade program sets the total amount of GHG emissions allowable for facilities under the cap and allows covered sources, including producers and consumers of energy, to determine the least expensive strategies to comply. On October 20, 2011, ARB adopted the final cap-and-trade regulation and Resolution 11-32. Under the program, in August and November 2012, the first auction of GHG emissions allowances will be held and on January 1, 2013 the compliance obligation for Covered Entities begins (the proposed Project is not a Covered Entity). The cap-and-trade program also allows for non-Covered Entities, including Voluntarily Associated Entities, to register with the program and purchase and hold GHG emission allowances.

TABLE 3.7-1
RECOMMENDED ACTIONS FROM ARB CLIMATE CHANGE SCOPING PLAN

ID #	Sector	Strategy Name
T-1	Transportation	Pavley I and II – Light-Duty Vehicle GHG Standards
T-2	Transportation	LCFS (Discrete Early Action)
T-3	Transportation	Regional Transportation-Related GHG Targets
T-4	Transportation	Vehicle Efficiency Measures
T-5	Transportation	Ship Electrification at Ports (Discrete Early Action)
T-6	Transportation	Goods-movement Efficiency Measures
T-7	Transportation	Heavy Duty Vehicle GHG Emission Reduction Measure – Aerodynamic Efficiency (Discrete Early Action)
T-8	Transportation	Medium and Heavy-Duty Vehicle Hybridization
T-9	Transportation	High Speed Rail
E-1	Electricity and Natural Gas	Increased Utility Energy efficiency programs More stringent Building and Appliance Standards
E-2	Electricity and Natural Gas	Increase Combined Heat and Power Use by 30,000GWh
E-3	Electricity and Natural Gas	Renewables Portfolio Standard
E-4	Electricity and Natural Gas	Million Solar Roofs
CR-1	Electricity and Natural Gas	Energy Efficiency
CR-2	Electricity and Natural Gas	Solar Water Heating
GB-1	Green Buildings	Green Buildings
W-1	Water	Water Use Efficiency
W-2	Water	Water Recycling
W-3	Water	Water System Energy Efficiency
W-4	Water	Reuse Urban Runoff
W-5	Water	Increase Renewable Energy Production
W-6	Water	Public Goods Charge (Water)
I-1	Industry	Energy Efficiency and Co-benefits Audits for Large Industrial Sources
I-2	Industry	Oil and Gas Extraction GHG Emission Reduction
I-3	Industry	GHG Leak Reduction from Oil and Gas Transmission
I-4	Industry	Refinery Flare Recovery Process Improvements
I-5	Industry	Removal of CH_4 Exemption from Existing Refinery Regulations
RW-1	Recycling and Waste Management	Landfill CH_4 Control (Discrete Early Action)
RW-2	Recycling and Waste Management	Additional Reductions in Landfill CH_4 – Capture Improvements
RW-3	Recycling and Waste Management	High Recycling/Zero Waste
F-1	Forestry	Sustainable Forest Target
H-1	High GWP Gases	Motor Vehicle Air Conditioning Systems (Discrete Early Action)
H-2	High GWP Gases	SF_6 Limits in Non-Utility and Non-Semiconductor Applications (Discrete Early Action)
H-3	High GWP Gases	Reduction in Perfluorocarbons in Semiconductor Manufacturing (Discrete Early Action)
H-4	High GWP Gases	Limit High GWP Use in Consumer Products (Discrete Early Action, Adopted June 2008)
H-5	High GWP Gases	High GWP Reductions from Mobile Sources
H-6	High GWP Gases	High GWP Reductions from Stationary Sources
H-7[a]	High GWP Gases	Mitigation Fee on High GWP Gases
A-1	Agriculture	CH_4 Capture at Large Dairies

a This original measure in the 2008 Scoping Plan was subsequently excluded by ARB in the Final Supplement to the Scoping Plan Functional Equivalent Document in 2011, as ARB staff concluded that implementation of this measure would not be feasible.

SOURCE: ARB, 2008.

Several registries of carbon offset credits have emerged in the United States in recent years. In the absence of mandatory GHG reduction requirements, these registries record and transfer ownership of offset credits for the voluntary market. The voluntary market has developed to serve those individuals, businesses, and institutions wishing to offset their own emissions, even in the absence of a regulatory requirement, or who are preparing for anticipated regulatory requirements. Registries facilitate and give legitimacy to carbon offset credit tracking and trading. One of the leading registries, the Climate Action Reserve (CAR), is expected to serve as a source of regulatory offsets under the future California cap-and-trade program; the CAR and its project protocols have been recognized as voluntary early actions under AB 32. CAR is respected as a national project registry that sets standards, accredits verifiers, and registers and tracks projects using sophisticated software to serialize and transfer emission reduction credits.

CEQA Guidelines Revisions

The State CEQA Guidelines are embodied in the California Code of Regulations (CCR), Public Resources Code, Division 13, starting with Section 21000. CEQA Guidelines Section 15064.4 specifically addresses the significance of GHG emissions, requiring a lead agency to make a "good-faith effort" to "describe, calculate or estimate" GHG emissions in CEQA environmental documents. Section 15064.4 further states that the analysis of GHG impacts should include consideration of (1) the extent to which the project may increase or reduce GHG emissions, (2) whether the project emissions would exceed a locally applicable threshold of significance, and (3) the extent to which the project would comply with "regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions." The CEQA Guidelines also state that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program (including plans or regulations for the reduction of greenhouse gas emissions) that provides specific requirements that will avoid or substantially lessen the cumulative problem within the geographic area in which the project is located (State CEQA Guidelines Section 15064(h)(3)). The State CEQA Guidelines do not, however, set a numerical threshold of significance for GHG emissions.

The CEQA Guidelines also include the following direction on measures to mitigate GHG emissions, when such emissions are found to be significant:

> Consistent with Section 15126.4(a), lead agencies shall consider feasible means, supported by substantial evidence and subject to monitoring or reporting, of mitigating the significant effects of greenhouse gas emissions. Measures to mitigate the significant effects of greenhouse gas emissions may include, among others:
>
> (1) Measures in an existing plan or mitigation program for the reduction of emissions that are required as part of the lead agency's decision;
>
> (2) Reductions in emissions resulting from a project through implementation of project features, project design, or other measures;
>
> (3) Off-site measures, including offsets that are not otherwise required, to mitigate a project's emissions;
>
> (4) Measures that sequester greenhouse gases; and

(5) In the case of the adoption of a plan, such as a general plan, long range development plan, or plans for the reduction of greenhouse gas emissions, mitigation may include the identification of specific measures that may be implemented on a project-by-project basis. Mitigation may also include the incorporation of specific measures or (Kern County, 2009) policies found in an adopted ordinance or regulation that reduces the cumulative effect of emissions.

(State CEQA Guidelines section 15126.4(a).)

Local

Kern County General Plan

The Kern County General Plan (Kern County, 2009), originally adopted on June 15, 2004, and last amended on September 22, 2009, contains the following policies with regard to GHGs.

Land Use, Conservation, and Open Space Element – Air Quality

Policy 19: In considering discretionary projects for which an Environmental Impact Report must be prepared pursuant to the California Environmental Quality Act, the appropriate decision making body, as part of its deliberations, will ensure that:

(a) All feasible mitigation to reduce significant adverse air quality impacts have been adopted; and

(b) The benefits of the proposed project outweigh any unavoidable significant adverse effects on air quality found to exist after inclusion of all feasible mitigation. This finding shall be made in a statement of overriding considerations and shall be supported by factual evidence to the extent that such a statement is required pursuant to the California Environmental Quality Act.

San Joaquin Valley Air Pollution Control District - District Policy

The San Joaquin Valley Air Pollution Control District (SJVAPCD) published the *District Policy – Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency* (SJVAPCD, 2009) in December 2009. This *District Policy* applies to projects for which the District has discretionary approval authority over the project and serves as lead agency for CEQA purposes. The *District Policy* establishes an approach to streamline the determination of project GHG emissions significance through the incorporation of Best Performance Standards (BPS). According to the SJVAPCD, BPS are defined as the most effective means of reducing or limiting GHG emissions from a GHG emissions source. According to the SJVAPCD, projects implementing BPS would be determined to have a less than significant individual and cumulative impact on global climate change and would not require GHG quantification. Projects exempt from the requirements of CEQA, and projects complying with an approved GHG emission reduction plan or mitigation program would also be determined to have a less than significant individual and cumulative impact on global climate change and would not require project specific quantification of GHG emissions (SJVAPCD, 2009). Quantification of project specific GHG emissions would be required for projects not implementing BPS. Such projects must be determined to have reduced or mitigated operational GHG emissions by 29 percent from BAU, consistent with GHG reduction

targets established in AB 32, in order to be considered to have a less than significant individual and cumulative impact for GHGs.

3.7.3 Impacts Assessment

Significance Criteria

The following criteria from Appendix G of the *CEQA Guidelines* are used as thresholds of significance to determine the impacts of the proposed project as related to GHGs. The proposed project would have a significant impact if it would:

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

GHG impacts are considered to be exclusively cumulative impacts; there are no non-cumulative GHG emission impacts from a climate change perspective (CAPCOA, 2008). The project's construction-related (temporary, short-term) emissions of GHGs and whether they would result in a cumulatively considerable contribution to global climate change are described below. Pursuant to CEQA Guidelines Section 15064.7(c), the EIR is employing both quantitative and qualitative thresholds of significance.

The SJVAPCD's methodology described above is geared toward long-term operational activities of larger land use development projects. However, since 97 percent of the project's GHGs are associated with electricity use (pumps and water conveyance), and PG&E is covered by cap-and-trade, the BAU criterion was deemed inapplicable for this project. The electricity provider is already compliant with California's efforts to reduce GHGs. Therefore, it is important to evaluate the majority of the proposed project's GHG emissions using a more applicable threshold. In light of the lack of established GHG emissions thresholds that would apply to the proposed project, CEQA allows lead agencies to identify thresholds of significance applicable to a proposed project that are supported by substantial evidence. In the case of GHG emissions and pursuant to the Appendix G checklist question, thresholds should also be linked with the Scoping Plan, which is the adopted plan for the state to meet GHG reduction targets.

Therefore, to establish additional context in which to consider the order of magnitude of the proposed project's related GHG emissions, this analysis accounts for the following considerations by other government agencies and associations about what levels of GHG emissions constitute a cumulatively considerable incremental contribution to climate change:

- Under AB 32, facilities (stationary, continuous sources of GHG emissions) that generate more than 25,000 metric tons of CO_2e per year must report their GHG emissions to ARB.

- BAAQMD had previously adopted 10,000 metric tons of CO_2e per year as the significance threshold for operational GHG emissions from stationary-source projects (BAAQMD, 2011) [1].

Since the majority of project GHG emissions are associated with stationary-source electricity use, the 10,000 metric tons of CO_2e per year threshold will be applied to the impact assessment for the proposed project.

Methodology

Construction and operational emissions were calculated by using California Emissions Estimator Model (CalEEMod) version 2013.2.2. CalEEMod is the SJVAPCD-recommended computer program that can be used to estimate anticipated emissions associated with land development projects in California. As CalEEMod currently uses IPCC's 1996 SAR to assign the GWPs for CH_4 and N_2O, the emissions for these two GHGs were taken from the CalEEMod outputs and converted to CO_2e emissions outside of CalEEMod using the updated GWPs from IPCC's AR4. For project construction, it was assumed that the majority of earthwork would be conducted at the Stockdale East site and that the Stockdale East and Stockdale West properties and the Central Intake would be built out in six phases (six months per phase) rather than all at once. The phases, which were assumed to start in late summer 2015, included the following: construction of the basins and CVC turnouts; construction of the wells (two phases);construction of the wellheads and pipelines (two phases); and construction of the Central Intake Pipeline. As described in the Project Description, there is also a third Stockdale project site that has yet to be identified. However, it is likely that annual construction activities and emissions would be similar to those analyzed below.

Electricity use for the project was estimated at up to 10,312,500 kwh/year. Off-road equipment and on-road vehicle GHG emissions were modeled for the worse-case year in which maintenance earthwork could occur on two of the project sites within the same year. Earthwork would involve disking or scraping the basins to remove the top layer (e.g., one inch) of sediment, approximately once every three years for a maximum of four weeks per year on each property. Otherwise, the typical year would consist of only periodic on-road trips for periodic inspection and minor maintenance.

For this analysis, the results are expressed in metric tons per year and are compared with the applied mass thresholds to determine impact significance. **Appendix C** of this Draft EIR provides detailed emission calculations used in this analysis.

[1] On March 5, 2012, the Alameda County Superior Court issued a judgment finding that the BAAQMD had failed to comply with CEQA when it adopted the thresholds of significance in the BAAQMD *CEQA Air Quality Guidelines.* The court did not determine whether the thresholds of significance were valid on their merits, but found that the adoption of the thresholds was a project under CEQA. BAAQMD appealed the court's decision and the Court of Appeal of the State of California, First District, reversed the trial court's decision. The Court of Appeal's decision was appealed to the California Supreme Court, which granted limited review, and the matter is currently pending there.

Impacts and Mitigation Measures

Threshold 1. Greenhouse Gas Emissions

Impact GHG-1: The proposed project could generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

The following activities associated with the proposed project could contribute to the generation of GHG emissions:

- ***Off-road Equipment Activities.*** Construction equipment typically uses fossil-based fuels to operate. The combustion of fossil-based fuels creates GHGs such as CO_2, methane, and N_2O. Furthermore, methane is emitted during the fueling of heavy equipment.
- ***Electricity.*** Electricity use can result in GHG production if the electricity is generated by combustion of fossil fuel. Default GHG emission factors for PG&E are included in CalEEMod.
- ***Motor Vehicle Use.*** Transportation associated with the project construction and operations would result in GHG emissions from the combustion of fossil fuels in automobile and truck trips.

Construction and operational emissions were modeled using CalEEMod software and compared to the 10,000 metric tons of CO_2e per year threshold, as described above. Construction emissions were amortized assuming a project life-time of 30 years and added to the worse-case annual operational emissions in order to determine the impact. Estimated GHG emissions associated with the proposed project are depicted in **Table 3.7-2** below. This impact would be less than significant without mitigation.

TABLE 3.7-2
ESTIMATED EMISSIONS OF GREENHOUSE GASES FROM OPERATION OF THE PROJECT

Source[a]	Emissions (metric tons of CO_2e per year)
Construction (Amortized)	48
Off-road Equipment – Operational Maintenance	26
Energy[b]	3,012
On-road Motor Vehicle Trips – Operational Maintenance	3
Total Project GHG Emissions (Construction + Operations)	3,089
Threshold	10,000
Significant (Yes or No)?	No

a GHG emissions were calculated using the CalEEMod model for the project site construction and operations. For the GHG emissions resulting from energy consumption by the project, the emissions were calculated using the emission factors from CalEEMod for the Pacific Gas & Electric Company and the project's anticipated annual electricity consumption. Additional assumptions and data are included in Appendix C.
b As recharge and recovery operations associated with the proposed project are not expected to occur simultaneously, the GHG emissions generated from the proposed project's annual energy consumption were estimated based on the recovery operations, which can consume up to 8.3 million kwh more energy annually than the recharge operations, to present a worst-case analysis.

Significance Determination

Less than significant.

Mitigation Measures

None required.

Threshold 2. Greenhouse Gas Emissions Plans

Impact GHG-2: The proposed project could conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

California's Climate Scoping Plan calls for local governments to reduce GHG emissions through the adoption of local programs as an important strategy to reduce community scale GHG emissions. However, Kern County has not yet adopted a Climate Action Plan.

As discussed above, 97 percent of the project's GHGs are associated with electricity use (pumps and water conveyance) and the electricity provider for the project, PG&E, is covered by cap-and-trade and is already compliant with California's efforts to reduce GHGs. In addition, a number of Scoping Plan Recommended Actions targeted at the transportation sector would be applicable to construction equipment and maintenance vehicles associated with the proposed project. However, given that these Recommended Actions are based on ARB enforced standards, it can be assumed that the proposed project would not conflict with implementation of such standards.

In summary, the proposed project would not conflict with any applicable plans, policies, or regulations adopted for the purpose of reducing GHG emissions. This would be a less than significant impact.

Significance Determination

Less than significant.

Mitigation Measures

None required.

References – Greenhouse Gas Emissions

Bay Area Air Quality Management District (BAAQMD), 2011. *CEQA Air Quality Guidelines*, revised May 2011.

California Air Pollution Control Officers Association (CAPCOA), 2008. *CEQA and Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act*.

California Air Resources Board (ARB), 2007. Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California Recommended for Board Consideration, October, 2007.

California Air Resources Board (ARB), 2008. *Climate Change Scoping Plan*. December 2008.

California Air Resources Board (ARB), 2014a. *California Greenhouse Gas Inventory for 2000-2012 — by Category Defined in the 2008 Scoping Plan*, March 24, 2014.

California Air Resources Board (ARB). 2014b. *Proposed First Update to the Climate Change Scoping Plan: Building on the Framework.* February.

California Air Resources Board (ARB), 2013. AB 32 Scoping Plan website, www.arb.ca.gov/cc/scopingplan/scopingplan.htm, page last reviewed April 3, 2013.

California Air Resources Board (ARB), 2011. *Final Supplement to the AB 32 Scoping Plan Functional Equivalent Document*, August 19, 2011.

Intergovernmental Panel on Climate Change (IPCC). 2007. *Climate Change 2007: Synthesis Report*.

Kern County, 2009. *Kern County General Plan*. Last amended September 22, 2009.

San Joaquin Valley Air Pollution Control District (SJVAPCD), 2009. *District Policy – Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency.* December 17, 2009.

3.8 Hazards and Hazardous Materials

This chapter assesses chemical usage and potential hazards at the project site and impacts that may occur as a result of implementing the proposed project. This chapter summarizes a hazardous materials database search conducted for the project area. Mitigation measures are developed to reduce potential impacts to less than significant levels.

3.8.1 Environmental Setting

Definitions

The California Code of Regulations (CCR) defines a hazardous material as a substance that, because of physical or chemical properties, quantity, concentration, or other characteristics, may either (1) cause an increase in mortality or an increase in serious, irreversible, or incapacitating, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of, or otherwise managed (CCR, Title 22, Division 4.5, Chapter 10, Article 2, Section 66260.10). Hazardous wastes are hazardous materials that no longer have practical use, such as substances that have been discarded, discharged, spilled, contaminated, or are being stored prior to proper disposal.

Hazardous materials and hazardous wastes are classified according to four properties: toxicity, ignitability, corrosivity, and reactivity (CCR, Title 22, Chapter 11, Article 3). Factors that influence the health effects of exposure to a hazardous material include the dose to which the person is exposed, the frequency of exposure, the exposure pathway, and individual susceptibility. In some cases, past industrial or commercial land uses on a site can result in spills or leaks of hazardous materials and petroleum to the ground, resulting in soil and groundwater contamination. Agricultural uses can result in contamination from pesticides, herbicides, pathogens, and high levels of nitrates from fertilizers and animal waste. Federal and state laws require that soils having concentrations of contaminants such as lead, gasoline, or industrial solvents that are higher than certain acceptable levels must be handled and disposed as hazardous waste during excavation, transportation, and disposal. The CCR, Title 22, §66261.20-24 contains technical descriptions of characteristics that would cause a soil to be classified as a hazardous waste.

Physical Settings

Stockdale East

A Phase 1 Environmental Site Assessment was conducted by RAM Environmental Engineering Services, Inc. for the Stockdale East parcel in 2009. The objective of the Phase 1 Environmental Site Assessment was to provide the client with information regarding potential areas of environmental concern that may be associated with past and/or current land use, both on and in the vicinity of the subject property. The Phase 1 Environmental Site Assessment was based on site inspections, literature reviews, review of aerial photographs, interviews with persons familiar

with the property, review of public records to identify known contaminated sites, and review of previous assessment of the property.

Stockdale East is approximately 237.5 acres and contains several drums and containers that are oilfield related located primarily on the western edge of the property, east of Enos Lane. Up to nine steel drums were identified onsite that were unlabeled and mostly empty. No below ground storage tanks were identified onsite; however, above ground tanks associated with oilfield operations were identified and typically contained oil, oil and water, and water from the oil wells. Additional chemicals were also identified onsite for agricultural production.

The Division of Oil, Gas, and Geothermal Resources (DOGGR) identified an oilfield within the property; in addition, current or historic oil and gas, and fluid injections were also found onsite. The oilfield operations have resulted in spillage, releases, and disposal onto the ground of oil, oil and water, and inert debris associated with oilfield production and storage. DOGGR has recently inspected the site (2013) and is remedying any outstanding regulatory issues. No evidence of hazardous substance releases was determined from agricultural operations.

The oilfield on Stockdale East includes nine wells: five are active; one is idle; two are plugged, and one is an active injection well (THC, 2014). Well construction records for the nine wells indicate that all are constructed with an upper casing and outer cement seal that extend to a minimum of 495 ft bgs. The depth of the oils wells range from 8,735 ft bgs to 12,673 ft bgs. The depth of the active injection well is 10,240 bgs (THC, 2014).

Approximately 0.23 miles east of Stockdale East is the Hondo Chemical site, which houses industrial activities relating to the creation of fertilizer and soil amendments. Hondo Chemical was ordered by Kern County to make changes to operations and clean-up procedures to ensure environmental safety. According to SWRCB's Geotracker the site is classified as a "Land Disposal Site" (Global ID L10008056166). The clean-up status of the site is classified as open, and there are no potential contaminants of concern listed. Preliminary groundwater testing on the site in 2011showed no signs of contamination; there is a continuing effort to monitor the groundwater wells on the site, and no groundwater concerns have been found (Kern County, 2015). In 2014, Kern County submitted a notice of violation to the property owners, and a remediation work plan has been submitted (Kern County Local Enforcement Agency (LEA), 2015).

Stockdale West

A Phase 1 Environmental Assessment has been prepared by Kleinfelder West, Inc. for the Stockdale West property in 2010. The Stockdale West property is approximately 323 acres and was developed as an agricultural property between 1946 and 1956 until recently. Two hundred acres of Stockdale West has been converted to groundwater recharge basins as part of IRWD's Pilot Recharge Project. The Pilot Recharge Project facilities include four recharge basins and earthen berms consisting of various sizes and depths.

Third Stockdale Site

The third Stockdale project site has not yet been determined but would be located within a radius that is populated with several active oilfields. Approximately 10 active oil and gas wells have been identified within the site radius (DOGGR, 2013). There is one site listed under the DTSC Cleanup Program within the site radius. Additional hazardous sites could be located within one mile of the site radius. Upon determination of the third Stockdale site, a Phase 1 Environmental Assessment of the project site will be prepared.

Central Intake

The Central Intake would be constructed along the eastern boundary of Stockdale East and within an easement through private property between Stockdale East and Goose Lake Slough. In addition to the conditions of Stockdale East as described above, approximately four inactive oil and gas wells and one active well are located in the vicinity of the alignment (DOGGR, 2014). DOGGR identified the active well as "idle" with the last activity recorded in 2011 (DOGGR, 2014). Neither the oil well nor others in the vicinity were listed as a hazardous materials site (NETROnline, 2015).

3.8.2 Regulatory Setting

Federal

Occupational Safety and Health Administration (OSHA)

The Occupational Safety and Health Administration (OSHA) was created by the Occupational Safety And Health Act, passed by congress in 1970. The Act was created to ensure safe and healthful working conditions for working men and women by setting and enforcing standards and by providing training, outreach, education and assistance. OSHA is part of the United States Department of Labor. The administrator for OSHA is the Assistant Secretary of Labor for Occupational Safety Health. OSHA's administrator answers to the Secretary of Labor, who is a member of the cabinet of the President of the United States.

Resource Conservation and Recovery Act (RCRA)

The Federal Toxic Substances Control Act (1976) and the Resource Conservation and Recovery Act of 1976 (RCRA) established a program administered by the U.S. Environmental Protection Agency (EPA) for the regulation of the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA was amended in 1984 by the Hazardous and Solid Waste Act (HSWA), which affirmed and extended the "cradle to grave" system of regulating hazardous wastes. The use of certain techniques for the disposal of some hazardous wastes was specifically prohibited by HSWA.

Toxic Substance Control Act (TSCA)

The Toxic Substances Control Act of 1976 (TSCA) provides US EPA with authority to require reporting, record-keeping and testing requirements, and restrictions relating to chemical substances and/or mixtures. Certain substances are generally excluded from TSCA, including, among others, food, drugs, cosmetics and pesticides. TSCA addresses the production,

importation, use, and disposal of specific chemicals including polychlorinated biphenyls (PCBs), asbestos, radon and lead-based paint.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, was enacted by Congress on December 11, 1980. This law provided broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. CERCLA established requirements concerning closed and abandoned hazardous waste sites; provided for liability of persons responsible for releases of hazardous waste at these sites; and established a trust fund to provide for clean up when no responsible party could be identified. CERCLA also enabled the revision of the National Contingency Plan (NCP). The NCP provided the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants or contaminants. The NCP also established the National Priorities List (NPL), which is a list of contaminated sites warranting further investigation by US EPA. CERCLA was amended by the Superfund Amendments and Reauthorization Act (SARA) on October 17, 1986.

General Pesticide Requirements for Agriculture

Pesticide use is regulated by the EPA and by the State of California Department of Pesticide Regulation (CDPR). USEPA sets broad restrictions on pesticide use; in general, California's laws are even more stringent than federal standards. Both federal and state laws require that pesticides be used according to their labels (CDPR, 2013). Agricultural operations also require the applicator to file a detailed report on monthly pesticide use with the local County Agricultural Commissioner's Office. County Agricultural Commissioners (CAC) serve as the primary local enforcement agents for pesticide laws and regulations. CDPR maintains pesticide usage data reported to the CAC in its Pesticides Use Reporting (PUR) Database.

State

California Code of Regulations (CCR)

The CCR is the official compilation and publication of the regulations adopted, amended or repealed by state agencies pursuant to the Administrative Procedure Act (APA). Properly adopted regulations that have been filed with the Secretary of State have the force of law.

The CCR is compiled into Titles and organized into Divisions containing the regulations of state agencies. Many of the regulations that pertain to hazardous materials are found in Title 22 (Social Security) Divisions 4 (Environmental Health) and 4.5 (Environmental Health Standards for the Management of Hazardous Waste).

California Hazardous Waste Control Law (HWCL)

The California Hazardous Waste Control Law (HWCL) is administered by the California Environmental Protection Agency (Cal/EPA) to regulate hazardous wastes. The HWCL is generally more stringent than RCRA. Under RCRA, individual states may implement their own

hazardous waste programs in lieu of RCRA, as long as US EPA has determined the state program is at least as stringent as Federal RCRA requirements. California's hazardous waste program has been federally approved. The HWCL lists 791 chemicals and about 300 common materials that may be hazardous; establishes criteria for identifying, packaging and labeling hazardous wastes; prescribes management controls; establishes permit requirements for treatment, storage, disposal and transportation; and identifies some wastes that cannot be disposed of in landfills.

California Hazardous Materials Release Response Plans and Inventory Law

The California Hazardous Materials Release Response Plans and Inventory Law of 1985 (Business Plan Act) requires preparation of Hazardous Materials Business Plans and disclosure of hazardous materials inventories. A business plan includes information such as an inventory of hazardous materials handled, facility floor plans showing where hazardous materials are stored, an Emergency Response Plan (ERP), and a Site Safety Plan with provisions for employee training in safety and emergency response procedures including an annual refresher course (California Health and Safety Code, Division 20, Chapter 6.95, Article 1). Statewide, the Cal/EPA, DTSC has primary regulatory responsibility for management of hazardous materials, with delegation of authority to local jurisdictions that enter into agreements with the state. The laws and regulations are administered locally by the Kern County Environmental Health Services Department.

California Occupational Safety and Health Administration

The California Occupational Safety and Health Administration (Cal/OSHA) is the primary agency responsible for worker safety in the handling and use of chemicals in the work place. Cal/OSHA standards are generally more stringent than federal regulations. The employer is required to monitor worker exposure to listed hazardous substances and notify workers of exposure (8 CCR Sections 337-340). The regulations specify requirements for employee training, availability of safety equipment, accident prevention programs, and hazardous substance exposure warnings.

Hazardous Materials Transportation Uniform Safety Act

The Hazardous Materials Transportation Uniform Safety Act (HMTUSA) was enacted in 1990 to clarify confusing state, local, and federal regulations. The act includes provisions to encourage uniformity among different State and local highway routing regulations, to develop criteria for the issuance of federal permits to motor carriers of hazardous materials, and to regulate the transport of radioactive materials. HMTUSA is regulated under OSHA.

Unified Hazardous Waste and Hazardous Materials Management Regulatory Program

In 1994, the Legislature created a Unified Hazardous Waste and Hazardous Materials Management Regulatory Program to consolidate and coordinate the activities of six separate hazardous materials programs under one agency, a Certified Unified Program Agency (CUPA). The intent has been to simplify the hazardous materials regulatory environment and provide a single point of contact for businesses to address inspection, permitting, billing, and enforcement issues. The CUPA for the County of Kern is the Environmental Health Services Department.

Department of Toxic Substance Control (DTSC)

Under the California Hazardous Waste Control Act, California Health and Safety Code, Division 20, Chapter 6.5, Sections 25100, et seq., the Cal/EPA, Department of Toxic Substance Control (DTSC) regulates the generation, transportation, treatment, storage, and disposal of hazardous waste in California. Under RCRA, individual states may implement their own hazardous waste programs in lieu of RCRA, as long as US EPA has determined the state program is at least as stringent as Federal RCRA requirements. California's hazardous waste program has been federally approved. Thus, in California, DTSC enforces hazardous waste regulatory requirements. The hazardous waste regulations establish criteria for identifying, packaging, and labeling hazardous wastes; dictate the management of hazardous waste; establish permit requirements for hazardous waste treatment, storage, disposal, and transportation; and identify hazardous wastes that cannot be disposed of in landfills.

DTSC is also the administering agency for the California Hazardous Substance Account Act, California Health and Safety Code, Division 20, Chapter 6.8, Sections 25300 et seq., also known as the State Superfund law, providing for the investigation and remediation of hazardous substances pursuant to State law. DTSC maintains a Hazardous Waste and Substances Site List for site cleanup. This list is commonly referred to as the Cortese List. Government Code Section 65962.5 requires the Cal/EPA to update the Cortese List at least annually. DTSC is responsible for a portion of the information contained in the Cortese List. Other State and local government agencies are required to provide additional hazardous material release information for the Cortese List.

California Accidental Release Prevention Program (CalARP)

California has developed an emergency response plan to coordinate emergency services provided by Federal, State, and local government and private agencies. Responding to hazardous materials incidents is one part of this plan. The plan is administered by the California Emergency Management Agency (Cal EMA), which coordinates the responses of other agencies, including Cal/EPA, California Highway Patrol (CHP), CDFW, the RWQCB, and the local fire department. The Kern County Fire Department (KCFD) provides first response capabilities, if needed, for hazardous materials emergencies within the project area.

Cal EMA is also the State administering agency for the California Accidental Release Prevention Program (CalARP) and California's Hazardous Materials Release, Response and Inventory Law (California's Business Plan Law). State and Federal laws require detailed planning to ensure that hazardous materials are properly handled, used, stored, and disposed of, and in the event that such materials are accidentally released, to prevent or to mitigate injury to human health or the environment. These laws require hazardous materials users to prepare written plans, such as Hazard Communication Plans and Hazardous Materials Management Plans. Laws and regulations require hazardous materials users to store these materials appropriately and to train employees to manage them safely. Primary responsibility for enforcement of these laws has generally been delegated to local agencies.

California Department of Forestry and Fire Protection (Cal Fire)

The California Department of Forestry and Fire Protection (Cal Fire) is dedicated to fire protection and stewardship of over 31 million acres of California's privately-owned wildlands. Cal Fire's mission is includes management and protection of California's natural resources Cal Fire's firefighters, fire engines, and aircraft respond to an average of more than 5,600 wildland fires each year and oversees enforcement of California's forest practice regulations, which guide timber harvesting on private lands. Cal Fire also provides Fire Hazard Severity Zone (FHSZ) Maps for State Responsibility Area lands and separate draft Very High FHSZ Maps for Local Responsibility Area lands. Cal Fire also requires counties within the state to develop fire protection management plans that address potential threats of wildland fires. The Kern County Wildland Fire Management Plan identifies federal, state, and local responsibility areas for the entire County to facilitate coordination efforts for fire protection services.

California Department of Pesticide Regulation – Restricted Materials Permits and Pesticide Use Report (PUR)

The California Department of Pesticide Regulation (CDPR) is dedicated to protect human health and the environment by regulating pesticide sales and use, and by fostering reduced-risk pest management. The State of California maintains a list of pesticides that are especially dangerous to human health or the environment if used incorrectly, commonly called restricted materials. These pesticides are listed in 3 CCR 6400. CDPR puts special controls and limitations on these pesticides; furthermore, the purchase or use of restricted materials for agricultural purposes requires a permit from the CAC. Use requirements for these pesticides are given in 3 CCR 6445 through 6489.

CDPR maintains a list of registered pesticides known to cause groundwater contamination in California; these pesticides are listed in Title 3, California Code of Regulations (3 CCR), Section 6800(a): atrazine, bantazon, bromacil, diuron, norflurazon, prometon, simazine. Section 6800(a) pesticides have certain use restrictions. Section 6800(a) pesticides are prohibited below the high water mark inside artificial recharge basins, unless the pesticide is applied six months or more before the basin is used to recharge groundwater (3 CCR Section 6487.1).

CDPR also maintains a list of pesticides that have the potential to move to, but are not currently found in groundwater, listed in 3 CCR 6800(b). Section 6800(b) pesticides are not prohibited for use in artificial recharge basins (CDPR, 2009).

CDPR also has regulations pertaining to wellhead protection and the use of pesticides, as listed in 3 CCR 6609 (CDPR, 2009). These measures apply to all wells (irrigation, domestic, municipal, monitoring, abandoned, dry, or drainage wells) where pesticides are mixed, loaded, rinsed, or otherwise used within 100 feet of the well. The following management measures are given by CDPR to protect wellheads:

- Wells protected from runoff:
  - The well should be sited so that no surface water runoff can contact the wellhead including the concrete base, or;

  - A berm should be constructed adjacent to the wellhead to prevent movement of surface water to the wellhead. Preemergent herbicides from the 6800(a) and 6800 (b) lists are prohibited between the berm and the wellhead.

- Wells not protected from runoff: The following activities are prohibited within 100 feet of an unprotected well:
  - Mixing, loading, and storing pesticides,
  - Rinsing of spray equipment or pesticide containers,
  - Maintenance of spray equipment that could result in a pesticide or pesticide residue spill,
  - Application of preemergent herbicides from the 6800(a) and 6800 (b) lists.

California became the first state to require full reporting of agricultural pesticide use in response to demands for more realistic and comprehensive pesticide use data. Under the PUR program, all agricultural pesticide use must be reported monthly to county agricultural commissioners, who in turn, report the data to CDPR.

Division of Oil, Gas, and Geothermal Resources (DOGGR)

The Division of Oil, Gas, and Geothermal Resources (DOGGR) was formed in 1915 to address the needs of the state, local governments, and industry by regulating statewide oil and gas activities with uniform laws and regulations. The Division supervises the drilling, operation, maintenance, and plugging and abandonment of onshore and offshore oil, gas, and geothermal wells, preventing damage to: (1) life, health, property, and natural resources; (2) underground and surface waters suitable for irrigation or domestic use; and (3) oil, gas, and geothermal reservoirs. Division requirements encourage wise development of California's oil, gas, and geothermal resources while protecting the environment.

The Division's programs include: well permitting and testing; safety inspections; oversight of production and injection projects; environmental lease inspections; idle-well testing; inspecting oilfield tanks, pipelines, and sumps; hazardous and orphan well plugging and abandonment contracts; and subsidence monitoring. Division mandated responsibilities are in Section 3000 et seq. of the Public Resources Code and Title 14, Chapter 4 of the California Code of Regulations.

Local

Kern County General Plan

The goals, policies, and implementation measures in the Kern County General Plan for hazards and hazardous materials applicable to the project are found in the Circulation Element and Safety Element. The Circulation Element describes transportation-related accidents and spills of hazardous materials as serious threat to the traveling public and nearby sensitive land uses. The Safety Element presents general polices and implementation measures to ensure safety precautions are followed and conformance with applicable plans and codes.

Kern County Wildland Fire Management Plan

The Kern County Wildland Fire Management Plan documents the assessment of wildland fire situations throughout the State Responsibility Areas (SRAs) within the County. The Kern County Fire Department Wildland Fire Management Plan provides for systematically assessing the existing levels of wildland protection services and identifying high-risk and high-value areas that are potential locations for costly and damaging wildfires. The goal of the plan is to reduce costs and losses from wildfire by protecting assets at risk through focused pre-fire management prescriptions and increasing initial attack success. Based on this assessment, preventive measures are implemented, including the creation of wildfire protection zones.

Kern County and Incorporated Cities Hazardous Waste Management Plan

In response to the growing public concern regarding hazardous waste management, State Assembly Bill 2948 enacted legislation authorizing local governments to develop comprehensive hazardous waste management plans. The intent of each plan is to ensure that adequate treatment and disposal capacity is available to manage the hazardous wastes generated within the local government's jurisdiction.

The Kern County and Incorporated Cities Hazardous Waste Management Plan (Hazardous Waste Plan) was first adopted by Kern County and each incorporated city before September 1988 and was subsequently approved by the State Department of Health Services. The Hazardous Waste Plan was updated and incorporated by reference into the Kern County General Plan in 2004 as permitted by Health and Safety Code Section 25135.7(b), and thus must be consistent with all other aspects of the Kern County General Plan.

The Hazardous Waste Plan provides policy direction and action programs to address current and future hazardous waste management issues that require local responsibility and involvement in Kern County. In addition, the Hazardous Waste Plan discusses hazardous waste issues and analyzes current and future waste generation in the incorporated cities, county, and state and federal lands. The purpose of the Hazardous Waste Plan is to coordinate local implementation of a regional action to effect comprehensive hazardous waste management throughout Kern County. The action program focuses on development of programs to equitably site needed hazardous waste management facilities; to promote on-site source reduction, treatment, and recycling; and to provide for the collection and treatment of hazardous waste from small-quantity generators. An important component of the Hazardous Waste Plan is the monitoring of hazardous waste management facilities to ensure compliance with federal and state hazardous waste regulations.

Kern County Department of Agriculture and Measurement Standards

The State of California maintains a list of pesticides that are especially dangerous to human health or the environment if used incorrectly, commonly called restricted materials. These pesticides are listed in 3 CCR 6400. The purchase or use of restricted materials for agricultural purposes requires a permit from the CAC, which is the Kern County Agricultural Commissioner. The permit application must list the types of restricted materials to be used, the areas to be treated, their location and size, crops to which the pesticide will be applied, pest problems, and the type of pesticide application method. Surrounding areas that could be harmed by pesticide

application must also be described or shown on a map. The CAC reviews the permit to decide if pesticide application will have an impact on human health or the surrounding environment; if the CAC believes harm may be likely, he or she can request the applicant to evaluate pesticide alternatives or impose extra controls (i.e. permit conditions) in addition to those already on the pesticide label or in regulations. If the CAC determines a pesticide cannot be used safely, he or she may deny the permit (CDPR, 2013).

Restricted materials permits are generally issued for one year, and require applicants to notify the CAC 24 hours prior to the scheduled pesticide application each time they plan to apply a restricted material. The CAC may inspect a site if he or she deems it necessary. The CAC may determine for that area that a non-restricted pesticide may present a hazard to human health or the environment; the CAC can require an agricultural operator to get a permit for pesticide use in that area. The determination for requiring a permit for a non-restricted use permit is a lengthy process, which may involve local officials and requires public notice. If a pesticide is not on the restricted materials list (3 CCR 6400), a farmer does not need a permit to apply it unless a local permit is required. Pesticides Use Reporting (PUR) Database.

3.8.3 Impact Assessment

Thresholds of Significance

The following criteria from Appendix G of the *CEQA Guidelines* are used as thresholds of significance to determine the impacts of the proposed project as related to hazards and hazardous materials. The proposed project would have a significant impact if it would:

1. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
2. 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.
3. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.
4. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment.
5. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area.
6. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area.
7. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

8. 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.
9. Cause an increase in airborne insect populations.

Effects Found Not to be Significant

Threshold 5. Airport Land Use Plan

The proposed project is not located within two miles of public airport or public use airport or located within an airport land use plan area. The Central Intake would be located adjacent to a private model airplane airfield north of Brimhall Road (approximately 650 feet in length). The nearest public commercial airport is Meadows Field Airport approximately 20 miles northeast of the project sites. The proposed project is not located within the Kern County ALUCP or within two miles of a public airport or public use airport. Therefore, no impact would occur.

Threshold 6. Airport Hazards

The project site is located within the vicinity of a private airstrip; Joe Gottlieb Field is located approximately 5.5 miles to the west. However, the private airfield is currently not operative. Therefore, no impacts would occur.

Threshold 7. Adopted Emergency Response Plan

The proposed project is not located within an adopted emergency response plan or emergency evacuation plan. In addition, all proposed project facilities would be located onsite at the Stockdale Properties and Central Intake alignment and would not impede access to any emergency responders. Therefore, no impacts would occur.

Threshold 8. Wildfires

According to the Cal Fire FHSZ Maps, the proposed project is not located within a high fire hazard zone or within a wildland area. Therefore, no impacts would occur.

Impacts and Mitigation Measures

Threshold 1. Transport, Use or Disposal of Hazardous Materials

Impact HAZ-1: The proposed project could create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

Construction of the proposed project would require the transport, use, and disposal of hazardous materials including but not limited to petroleum products (i.e. oil, gasoline, and diesel fuels) and automotive fluids (i.e. antifreeze and hydraulic fluids). The use, handling, storage, and disposal of the hazardous materials would be regulated by local, state, and federal regulations. Fuels and lubricants used on field equipment would also be subject to local, state, and federal regulations.

The proposed project would also comply with the Caltrans requirements and regulations regarding hazardous materials transport.

During operation, maintenance activities at the recharge and recovery facilities on the Stockdale Properties and at the Central Intake would require weed and pest control operations, as necessary. Periodic earthwork operations would also be required to maintain levees, enhance soil permeability, and remove vegetative growth. The transport, use and disposal of hazardous materials during operation and maintenance would comply with applicable regulations. Therefore impacts related to maintenance activities would be less than significant.

In addition, conventional agricultural practices would be allowed at the Stockdale Properties during the interim periods when the recharge basins are not used for active recharge operations. Conventional farming would be in compliance with all applicable regulatory requirements of the USEPA, CDPR, and the Kern CAC. Farming operations could include the use of restricted or unrestricted materials, including pesticides that are listed in 3 CCR Section 6800(a) and/or 6800(b). IRWD and Rosedale would require all contract farmers to comply with regulations pertaining to application of pesticides within recharge basins and in proximity to wellhead. In accordance with CDPR regulations, Section 6800(a) pesticides would be restricted from application below the high water mark inside the recharge basins, unless the pesticide is applied six months or more before the basin is used for groundwater recharge. Section 6800(b) pesticides could be used within the recharge basins without restriction, also in accordance with CDPR regulations. All required measures pertaining to wellhead protection also would be implemented, such as prohibiting mixing, loading, spraying, storage or pesticides within 100 feet of an unprotected wellhead, and prohibiting application of pre-emergent herbicides from the 6800(a) and 6800(b) lists between the berm and the wellhead of a protected wellhead.

Rosedale and IRWD would require the contract farmer to obtain a permit from the CAC for application of restricted materials and to comply with all conditions of the permit in order to ensure the protection of human health and the environment. The contract farmer also would be required to notify the CAC 24 hours prior to application of any restricted materials on the Stockdale Properties. The contract farmer would be required to inform Rosedale and IRWD and the CAC in the event of any accidental spill or inappropriate application of pesticides onsite. The contract farmer would be required to remediate completely and dispose of properly all contaminated soil to prevent the transport of pesticides into the groundwater and protect public health. Compliance with regulatory requirements pertaining to pesticide use would ensure impacts would be less than significant.

The oilfield on Stockdale East includes an injection well that is subject to regulation by the DOGGR Class II Underground Injection Control (UIC) program, which enforces the requirements of the federal Safe Drinking Water Act. DOGGR has primary responsibility for regulating injection wells associated with oil and gas production pursuant to the UIC program which is subject to oversight by the U.S. Environmental Protection Agency (USEPA). Written approval from DOGGR is required before any subsurface injection associated with oil or gas production can begin (CCR, Title 14, Sections 1714 and 1724.6). The injection well on Stockdale East has been constructed to enable the injection of wastewater produced during oil production at

a depth of 10,200 feet bgs. The well also has a cement casing comprising the upper 515 feet bgs (THC, 2014; see **Appendix H**). In general, such oilfield injection wells have potential to include toxic fluids in the wastewater being injected. However, due to the depth of this injection well, it is unlikely that fluids injection would have any impacts on water banking operations, since the bottom depth of the usable aquifer below Stockdale East is approximately 667 feet bgs (THC, 2015), resulting in a separation of over 9,500 feet between the bottom of the aquifer and the bottom of the injection well. In addition, historic groundwater fluctuations have occurred in the upper approximate 290 feet bgs, which is well above the bottom of the cement seal at 515 feet bgs. The proposed project would potentially lower groundwater levels below Stockdale East by up to 27 feet (THC, 2015; see Chapter 3.9 for further detail). This modeled drawdown would not cause groundwater levels to reach 515 ft bgs and as such would not significantly change the hydraulic connection of the injection well with the usable aquifer system. Therefore, the proposed project would not result in the introduction of hazardous materials into the usable groundwater aquifer below the project site. Impacts are considered less than significant.

Impact Determination

All hazardous materials transported, used, and disposed of during construction and operation and maintenance activities would be done according to applicable regulations that would limit significant hazards to the environment. The transport, use, and disposal of pesticides would also be done in accordance with applicable regulatory requirements, including regulations specific to application of pesticides within recharge basins and in proximity to wellheads. Therefore impacts regarding the transport, use, and disposal of hazardous materials would be less than significant.

Operation of the oilfield injection well on Stockdale East would be regulated in accordance with the DOGGR UIC program. Due to the depth of the injection well relative to the usable groundwater aquifer, and the depth of the cement seal relative to groundwater level fluctuations, the proposed project would not introduce hazardous materials into the groundwater due to co-location of the proposed water banking facilities with the existing oilfield injection well. Impacts would be less than significant.

Significance Conclusion

Less than Significant.

Mitigation Measures

None required.

Threshold 2. Accidental Upset of Hazardous Materials

Impact HAZ-2: The proposed project could 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.

Construction of the proposed project would require the transport, use, and disposal of hazardous materials including but not limited to petroleum products, lubricants, and fuels. During project construction, hazardous materials could accidently be spilled or otherwise released in the environment and expose construction workers, the public, and/or the environment to potentially hazardous conditions. The proposed project would be required to adhere to federal, state, and local safety regulations and implement best management practices (BMPs) related to hazardous materials use and handling that would minimize significant hazardous releases and prevent the release of hazardous materials to the environment.

According to DOGGR, the Stockdale East property is currently cultivated for agricultural purposes but also contains an active oilfield. The oilfield includes oil pads and oil drums associated with oilfield activities. The oilfield has resulted in surface spillage, releases, and disposal of oil, oil and water, and inert debris associated with oilfield production and storage. The oilfields would remain active during project implementation and operation, and proposed recharge basins, production wells, and conveyance structures would avoid the oilfield areas. The proposed recharge basin and conveyance structure layout would accommodate existing and future drill islands to maintain access to underlying mineral rights. However, hazardous materials that have been accidentally released at the current oilfield site could have migrated beyond the boundaries of the oilfield area, and as such could expose construction workers to potential hazardous substances and introduce hazardous substances to the groundwater during recharge operations.

In addition, historical use of the Stockdale East site also included agricultural production. This past agricultural land use may have resulted in contaminated soils due to the presence of persistent agricultural chemical residues from herbicide and pesticide applications. As a result, construction workers could be exposed to such contaminated soils, and hazardous chemicals could be introduced to groundwater during recharge operations. Construction of the recharge basins will involve scraping/excavating surface soils to create berms, such that the recharge basin floors are below grade. Any residual pesticides in the surface soils of the former agricultural areas would be scraped off the recharge basin floor. The potential for residual pesticides to be transported to the groundwater by the recharge water is minimal since the surface soils will be scrapped from the basin floors.

Implementation of **Mitigation Measure HAZ-1** would require that samples of soils onsite at the Stockdale East property are analyzed and appropriately remediated or removed if soils contain hazardous quantities of contaminants. This would reduce any potential impacts to construction workers due to encounters with hazardous materials to less than significant levels and reduce impacts to groundwater due to potential transport of hazardous substances during recharge activities.

In addition, as with many former agricultural properties, it is possible that irrigation lines on the property may contain asbestos or be wrapped in asbestos. If these irrigation lines are reused or demolished, asbestos materials may pose an adverse impact to the workers and the site. If asbestos-containing materials are uncovered during construction, **Mitigation Measure HAZ-2** would require all work at the project sites to halt so that a proper assessment can be made and

proper worker protection measures can be implemented. Implementation of Mitigation Measures HAZ-1 and HAZ-2 would reduce impacts related to accidental upset or encounter of hazardous materials at Stockdale East to a less than significant level.

According to the DOGGR database, approximately 10 active oil and well fields are located within the site radius boundaries where the third Stockdale project site would be located. Although the site has not yet been determined, it is anticipated that the third Stockdale site would be located within agricultural lands. In the event the third Stockdale site is located on a site that contains an active oilfield, impacts to the environment resulting from spillage, releases, and disposal of oil associated with oilfield production and storage may have occurred in the past or could occur during construction. This could potentially expose construction workers to potential hazardous substances or introduce hazardous substances to groundwater during recharge operations. According to DOGGR, one active but idle oil and gas well exists in the vicinity of the preliminary Central Intake alignment. This well could have also released hazardous materials that migrated beyond the boundaries of the oilfield area.

Mitigation Measure HAZ-3 would require the completion of a Phase I ESA to ensure hazards and appropriate mitigation measures are identified for the third Stockdale site and Central Intake Pipeline prior to construction. Implementation of these mitigation measures would reduce impacts to a less than significant level.

Impact Determination

The proposed project would adhere to applicable safety regulations and implement BMPs related to hazardous materials use and handling that would minimize significant hazardous releases and prevent the release of hazardous materials to the environment. In addition, all use, handling, and disposal of hazardous materials would comply with manufacturer directions and all applicable regulations. Mitigation Measure HAZ-1 would require that samples of soils at the Stockdale East property are analyzed and removed appropriately if soils contain hazardous quantities of contaminants. Mitigation Measure HAZ-2 would require that a proper assessment can be made of the potential to encounter asbestos-containing materials. Mitigation Measure HAZ-3 would require the completion of a Phase I ESA for the third Stockdale project site and Central Intake Pipeline are identified. Therefore, impacts related to the accidental upset or encounter of hazardous materials would be less than significant with mitigation.

Significance Conclusion

Less than Significant with Mitigation.

Mitigation Measures

HAZ-1: Prior to construction at Stockdale East, Rosedale shall collect representative samples of soils remaining in place near the oilfield as identified in the Phase 1 Environmental Site Assessment. The samples shall be analyzed for total petroleum hydrocarbons and pesticides. Rosedale shall avoid if feasible or otherwise remove from the site soils identified as containing hazardous quantities of contaminants and dispose of such soils in accordance with applicable hazardous waste regulations.

HAZ-2: In the event that asbestos-containing materials are uncovered during project construction, work at the project sites shall immediately halt and a qualified hazardous materials professional shall be contacted and brought to the project sites to make a proper assessment of the suspect materials. All potentially friable asbestos-containing materials shall be removed in accordance with Federal, State, and local laws and the National Emissions Standards for Hazardous Air Pollutants guidelines prior to ground disturbance that may disturb such materials. All demolition activities shall be undertaken in accordance with California Occupational Safety and Health Administration standards, as contained in Title 8 of the CCR, Section 1529, to protect workers from exposure to asbestos. Materials containing more than one percent asbestos shall also be subject to San Joaquin Valley Air Pollution Control District regulations. Demolition shall be performed in conformance with Federal, state, and local laws and regulations so that construction workers and/or the public avoid significant exposure to asbestos-containing materials.

HAZ-3: A Phase I Environmental Site Assessment shall be prepared for the Central Intake Pipeline and third Stockdale project site to identify potential hazards and hazardous materials located within a one-mile radius. The construction contractor shall be informed of potential hazards and shall develop appropriate plans to avoid or remediate hazards.

Threshold 3. School Hazards

Impact HAZ-3: The proposed project could emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

There are no schools located within a one-quarter mile radius of Stockdale West, Stockdale East, or the Central Intake alignment. The closest schools would be Rio Bravo Greeley School located approximately 3.5 miles north of the northernmost portion of the Central Intake (at Brimhall Road) and Del Rio Elementary School located approximately four miles east of Stockdale East and the Central Intake. Therefore, no impacts to schools would occur as a result of construction and operation at Stockdale West, Stockdale East, and the Central Intake alignment.

The third Stockdale site has not yet been determined but would be located within the additional site radius. The Rio Bravo Greeley School located at 6601 Enos Lane, is adjacent to the northern boundary of the additional site radius at the cross streets of Enos Lane and Rosedale Highway. In the event the third Stockdale site is to be located within a quarter mile of the school, impacts related to the construction and operation of the proposed project could occur. As discussed above, the proposed project would adhere to all required federal, state, and local safety regulations and implement BMPs related to hazardous materials use and handling that would minimize significant hazardous releases and prevent the release of hazardous materials to the environment. Implementation of **Mitigation Measure HAZ-4** would require coordination with the Rio Bravo-Greeley Union School District and the affected schools to determine a haul route that would not impact existing school safety routes. Implementation of the mitigation measure would ensure

impacts to the school facilities during construction are minimized. Therefore, impacts to schools would be less than significant with mitigation.

Impact Determination

Stockdale East, Stockdale West, and the Central Intake Pipeline are not located within a quarter mile of an existing or proposed school. The third Stockdale project site has not yet been determined but could potentially impact the Rio Bravo Greeley School located adjacent to the northern edge of the site radius boundary. Mitigation Measure HAZ-4 requires construction coordination with the Rio Bravo-Greeley Union School District and affected schools. Impacts would be less than significant with mitigation.

Significance Conclusion

Less than Significant with Mitigation.

Mitigation Measures

HAZ-4: In the event the third Stockdale project site is located within a quarter mile of any school facilities, prior to construction, the contractors shall coordinate the proposed project construction route with the impacted school district and school facility to avoid school safety routes.

Threshold 4. Hazardous Materials Site

Impact HAZ-4: The proposed project could be located on a site which is included on a list of hazardous materials sites and could create a significant hazard to the public or the environment.

The Stockdale West property is not included on a list of hazardous material sites (NETROnline, 2015). In addition, although Stockdale East currently includes an active oilfield, this site also is not included on a list of hazardous material sites. The proposed alignment for the Central Intake Pipeline is located near an active but idle oil well; however this well does not appear on a list of hazardous material sites (NETROnline, 2015). Therefore, implementation of project facilities on Stockdale East and Stockdale West and the Central Intake alignment would not create an associated significant hazard to the public or the environment.

For the third Stockdale project site, according to DOGGR, there are approximately 10 active oilfields and well fields located within the site radius for this third project site. The location of the third Stockdale project site is anticipated to be on agricultural land but also may have an active oilfield or well field onsite. Such facilities could result in contaminated soils onsite.

Impact Determination

Stockdale East, Stockdale West, and the Central Intake are not included on lists of hazardous materials sites, and thus there would be no associated hazards associated with development of proposed project facilities at these sites. There is potential for the third Stockdale project site to be located on a property with an active oilfield or well field or other hazardous materials or

contamination. Mitigation Measure HAZ-3 would require a Phase I ESA to be completed once the third Stockdale project site is identified. Therefore, impacts would be less than significant with mitigation.

Significance Conclusion

Less than Significant with Mitigation.

Mitigation Measures

Implement **Mitigation Measure HAZ-3**.

Threshold 9. Vector Control

Impact HAZ-5: The proposed project operation could cause an increase in airborne insect populations.

The proposed recharge basins at the Stockdale Properties would create new standing pools of water. If algae growth develops or insects such as midges or mosquitoes use the water as a breeding area, any standing pools of water could be considered a nuisance or a health threat to the surrounding community. Hatching midges can emerge in such tremendous numbers that they create nuisance problems. Midges often emerge simultaneously forming vast clouds of flying insects. They are especially attracted to lights. Large clouds of insects could form over local roadways creating a traffic hazard.

West Nile Virus, a disease transmitted by mosquitoes, has been detected in Kern County with approximately 25 human cases in 2013 and 13 human cases in 2014 (Kern County Public Health Services Department, 2015). The Kern County Department of Public Health Services has provided residents with tips for avoiding the West Nile Virus. The proposed project could contribute to a public health hazard if the standing water in the recharge basins contributed to an increase in the mosquito population in the project area.

Impact Determination

Mitigation Measure HAZ-5 would require coordination with the Kern County Department of Public Health Services and the Kern Mosquito and Vector Control District to ensure development of appropriate insect control measures that utilize abatement methods appropriate for recharge basins, such that groundwater quality is protected. Mitigation Measure HAZ-5 would minimize the potential effects associated with airborne insect populations by minimizing population increases. Impacts would be less than significant with mitigation.

Significance Conclusion

Less than Significant with Mitigation.

Mitigation Measures

HAZ-5: IRWD and Rosedale shall coordinate with the Kern County Department of Public Health Services and the Kern Mosquito and Vector Control District prior to project operations to develop and implement, if necessary, appropriate insect abatement methods. Such methods shall not utilize any substances that may contaminate groundwater.

References – Hazards and Hazardous Materials

California Department of Conservation, Division of Oil, Gas and Geothermal Resources (DOGGR), 2013 and 2014. *DOGGR Online Mapping System.*

California Department of Forestry and Fire Protection (CalFire), 2007. *Draft Fire Hazard Severity Zones in LRA.*

California Department of Forestry and Fire Protection (CalFire), 2007. *Draft Fire Hazard Severity Zones in SRA.*

California Department of Pesticide Regulation (CDPR), 2008. *The Permit Process for Restricted Pesticides*. Publication: Permitting/REV2/08.

California Department of Pesticide Regulation (CDPR), 2013. *California Code of Regulations (Title 3. Food and Agriculture), Division 6. Pesticides and Pest Control Operations*. California Code of Regulations, Title 3. Available at: http://www.cdpr.ca.gov/docs/legbills/calcode/chapter_.htm

California Department of Pesticide Regulation (CDPR), 2013. *Pesticide Use Reporting Database*. Accessed April 8, 2009. Available at: http://www.cdpr.ca.gov/docs/pur/purmain.htm

Kern County Digital Mapping Service, 2013. *Kern County Fire Hazard Severity Zones Map.*

Kern County Digital Mapping Service, 2013. *Kern County Flood Map.*

Kern County Fire Department, 2009. *Wildland Fire Management Plan Air & Wildland Division.*

Kern County Local Enforcement Agency (LEA), 2015. Personal communication with Jeffrey Marshall, Program Supervisor, Kern County LEA. February 13, 2015, 8:40 A.M.

Kern County Public Health Department, 2008. *Kern County West Nile Virus Strategic Response Plan.*

Kern County Public Health Services Department, 2015. *Communicable Disease Control – West Nile Virus*. Accessed on February 10, 2015. Available at http://www.kernpublichealth.com/departments/cd/westnile.aspx.

Kern County, 2009. *Kern County General Plan Circulation Element.*

Kern County, 2009. *Kern County General Plan Safety Element.*

Kleinfelder West, Inc. 2010a. *Phase I Environmental Site Assessment Grimmway Property*.

Kleinfelder West, Inc., 2010b. *Irvine Ranch Water District Grimmway Property, Kern County, CA Property Assessment Report*.

NETROnline, 2015. *Environmental Radius Report- Third Stockdale Site and Central Intake, 35.368079306299734, -119.23360057174852*.

NETROnline, 2015. *Environmental Radius Report-Stockdale East and West, Stockdale Highway and Enos Lane*.

RAM Environmental Engineering Services, Inc., 2009. *Rosedale Rio Bravo Water Storage District Phase I Environmental Site Assessment (ESA-1)*.

Thomas Harder & Co. (THC), 2014. *Draft Technical Memorandum – Stockdale Integrated Banking Project – Potential Impacts of Groundwater Level Changes on Abandoned Oil Wells*. Prepared for Rosedale-Rio Bravo Water Storage District. April 11, 2014.

Thomas Harder & Co. (THC), 2015. *Draft Proposed Stockdale Integrated Banking Project – Analysis of Potential Groundwater Level Changes from Recharge and Recovery at the Stockdale West and Stockdale East Facilities*. Prepared for Rosedale-Rio Bravo Water Storage District and Irvine Ranch Water District. January 23, 2015.

3.9 Hydrology and Water Quality

This chapter of the document discusses potential impacts of the proposed project on hydrology, groundwater resources and water quality conditions. The setting section describes the 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. The significance criteria follow the regulatory discussion are adapted from Appendix G of the *CEQA Guidelines*. Based on the significance criteria, the potential project-related impacts associated with hydrology, groundwater resources, and water quality are evaluated and appropriate mitigation measures are developed, where necessary.

3.9.1 Environmental Setting

As mentioned previously in Chapter 1, the *CEQA Guidelines* Section 15125(a) requires that a Draft EIR include a description of the physical environmental conditions as they exist when the NOP is published. This environmental setting typically constitutes the baseline against which the lead agency compares the physical environmental changes that may occur as a result of the project and determines whether such impacts are significant. The lead agency may, however, determine that a different baseline is appropriate, with justification. For example, a baseline may constitute a range of conditions over a representative time period for dynamic resources that have characteristics that can fluctuate greatly over temporal scales, such as river flow or groundwater levels. This ensures that an outlier or transitory condition is not used as the baseline condition out of context and that a representative range is established from which to analyze impacts of a project. For the analysis in this Draft EIR, the baseline for groundwater levels is based on historical hydrological conditions during a study period that includes the maximum historical high and low groundwater levels in the project area. This is further described and explained below.

Regional Setting

Climate

The project site is located in the southern portion of the Central Valley within the San Joaquin Valley. This region of Central California is characterized by a climate considered to be semi-arid, characterized by relatively low annual precipitation averages of fewer than ten inches and evaporation in excess of precipitation (Kern County Planning Department, 2004). During the recent twelve month period of February 1, 2014 through February 1, 2015, precipitation in Kern County was between 0.5 and 10 inches (High Plains Regional Climate Center, 2015). More than half of the annual rainfall occurs between December and February with scattered shower activity during the other nine months. Low dense fog known as Tule fog is common in the winter months. Summers are generally dry with low humidity and very warm with most days between June and September above 90 degrees Fahrenheit (WRCC, 2009).

Regional Topography

San Joaquin Valley makes up the southern two-thirds of the Central Valley which stretches across the central spine of California. San Joaquin Valley is generally characterized by a relatively flat topography associated with the wide valley floor. The valley is comprised of large coalescing alluvial fans that have developed along each side of the valley. The larger and more gently sloping fans on the east side consist of deposits eroded and carried down from the granitic Sierra Nevada mountains; whereas, the smaller and more steeply sloping fans on the west side are built up by sediments originating from marine sedimentary rocks of the Coast Range Temblor mountains. As a result, the valley floor consists mainly of two different kinds of alluvial materials that are derived from opposite sides of the basin and have different physical and geological properties. The project site is located along the Kern River Fan, which is comprised of unconsolidated sandy and silty sediments derived from the Sierra Nevada Mountains.

Surface Water Hydrology

The San Joaquin River is the major drainage for the San Joaquin Valley; however the southernmost portion of the valley is hydrologically separated from the San Joaquin River. This area of the valley is drained primarily by the Kern River. The Kern River originates on the eastern side of Tulare County west of Mount Whitney in the high Sierra Nevada Mountains. As it flows south through the Sierra Nevada, it emerges at Kernville into a widening valley before entering Lake Isabella, a reservoir formed on the river by the Isabella Dam. Downstream from the dam it flows southwest, through rugged canyons until emerging east of Bakersfield. Past Bakersfield, the river is highly diverted through a series of canals for agricultural and municipal water supply purposes. The Kern River Fan, referred to locally as the Kern Fan, covers an area of approximately 200 square miles and contains prolific subsurface water-bearing sedimentary deposits that make up the principal groundwater bearing units (Meillier, 2001). The fan deposits are heterogeneous but consist primarily of sand and gravel deposits along with some finer grained deposits. The sediments originate predominantly from weathered granitics from the Sierra Nevada Range.

Surface Water Quality

As part of the requirements of the Clean Water Act, beneficial uses for surface waters must be identified in the Central Valley Regional Water Quality Control Board's (RWQCB) Water Quality Control Plan (Basin Plan). The project site is located within the Tulare Lake Basin where the Kern River has a number of beneficial uses identified including municipal supply, agricultural supply, industrial supply, industrial process, hydropower generation, contact and non-contact recreation; warm freshwater habitat; wildlife habitat; rare, threatened or endangered species; and groundwater recharge (RWQCB, 2004). Water quality management for the Kern River is based on these identified uses.

The Basin Plan sets water quality objectives that are qualitative and quantitative in order to protect those uses. The water quality parameters for which numerical limits were selected from the sources listed above are: total alkalinity, total mercury, dissolved iron, dissolved copper, dissolved zinc, dissolved arsenic, dissolved lead, chloride, and ammonia. However, in some cases

the natural background level of a particular constituent is higher than the beneficial use protective numerical limit. In such instances, the natural background level is considered to comply with the water quality objective (RWQCB, 2004).

According to the requirements of the Clean Water Act, the Central Valley RWQCB has listed impaired water bodies due to elevated levels of contaminants. The Kern River is not listed as an impaired water body (RWQCB, 2010).

Regional Hydrogeology

The project site is located within the Kern County Subbasin of the San Joaquin Valley Groundwater Basin (DWR, 2006). The subbasin covers the western third of Kern County and includes Kern River and Poso Creek. The project area is located in the central part of the Kern County Subbasin. Geologically, San Joaquin Valley is a structural trough created by tectonic forces and filled with older marine and younger continental sediments that were eroded from the surrounding mountains. These continental sediments derived from the alluvial processes form a wedge of deposits that thicken toward the center of the valley.

The sedimentary deposits of the San Joaquin Valley have been estimated to range in thickness from 175 to 2,900 feet with an average of approximately 600 feet (DWR, 2006). Specific yield, the amount of water in storage in the ground that will drain under the influence of gravity and a measurement of water available for man's use, ranges from about 3 – 12% in silts, 15 – 27% in sands and as high as 31% for gravels in the interval from surface down to 300 to 600 feet deep (DWR, 2006). The highest specific yield measurements are associated with sediments of the Kern Fan west of Bakersfield. The well-sorted, sandy sediments have higher specific yields than finer grained silts and clays. For most of the subbasin, excluding the area of the Kern Fan, there are two water bearing units that are separated by an aquitard known as the Corcoran Clay, which restricts vertical groundwater flow between the overlying unconfined aquifer and the underlying confined aquifer. The hydrogeology of the Kern Fan region is characterized by thick alluvial deposits with an upper unconfined aquifer and areas where there are semi-confined conditions. A semi-confined aquifer is also referred to as a leaky aquifer where the confining layer is not continuous and vertical flow occurs between the upper unconfined aquifer and the lower aquifer. Some estimates indicate a total water storage capacity for the Kern County Subbasin of 40 million acre-feet (AF) (DWR, 2006).

The upper aquifer is considered to be unconfined and extends down to a depth of approximately 200 to 400 feet. The upper unconfined aquifer consists of interbedded silts, sands, with some minor deposits of clay (Meillier, 2001). In the Kern Fan area west of Bakersfield, the Corcoran Clay is not generally present although there are numerous discontinuous clay layers that can locally restrict vertical flow creating a separation between a shallow unconfined aquifer and a deeper semi-confined aquifer. The lower semi-confined aquifer, on average, extends to a depth of approximately 600 feet though in some areas can be quite deeper and generally considered to range between 535 and 750 feet (THC, 2015).

During the period of 1926 to 1970, groundwater recovery resulted in up to nine feet of land subsidence in the south-central area of the subbasin, which does not coincide geographically with the location of the proposed project in the central portion of the subbasin. Groundwater banking operations started as early as 1978 and began diverting surface water into the aquifer throughout the subbasin primarily in the Kern Fan area. Since 1970, groundwater levels within the subbasin experienced two complete cycles of rising then falling due to climatic wet/dry cycling and addition of conveyance and recharge facilities. By the year 2000, water levels generally equaled those that were observed in 1970 (DWR, 2006).

Groundwater Levels and Gradient

Groundwater levels in the Kern Fan area have historically been influenced by recovery and more recently are dominated by recharge and recovery operations. With the onset of increased groundwater banking and recharge operations in the late 1990s, water levels rose above historic levels but are still susceptible to the effects of groundwater pumping. According to data from monitoring wells in the project area, groundwater levels dropped to historic lows in 2010 and again in 2014 in the project area (THC, 2015; Kern Fan Monitoring Committee, 2015).

Despite fluctuating groundwater levels, over time the northwest direction of groundwater flow has remained relatively consistent in the region. However, local changes in aquifer use can cause shifting in gradient direction. Recharge and recovery activities will generally increase the gradient during the early period of a recharge event due to the effective mounding of the groundwater table and decrease, flatten, or even reverse during a recovery period.

Groundwater Banking

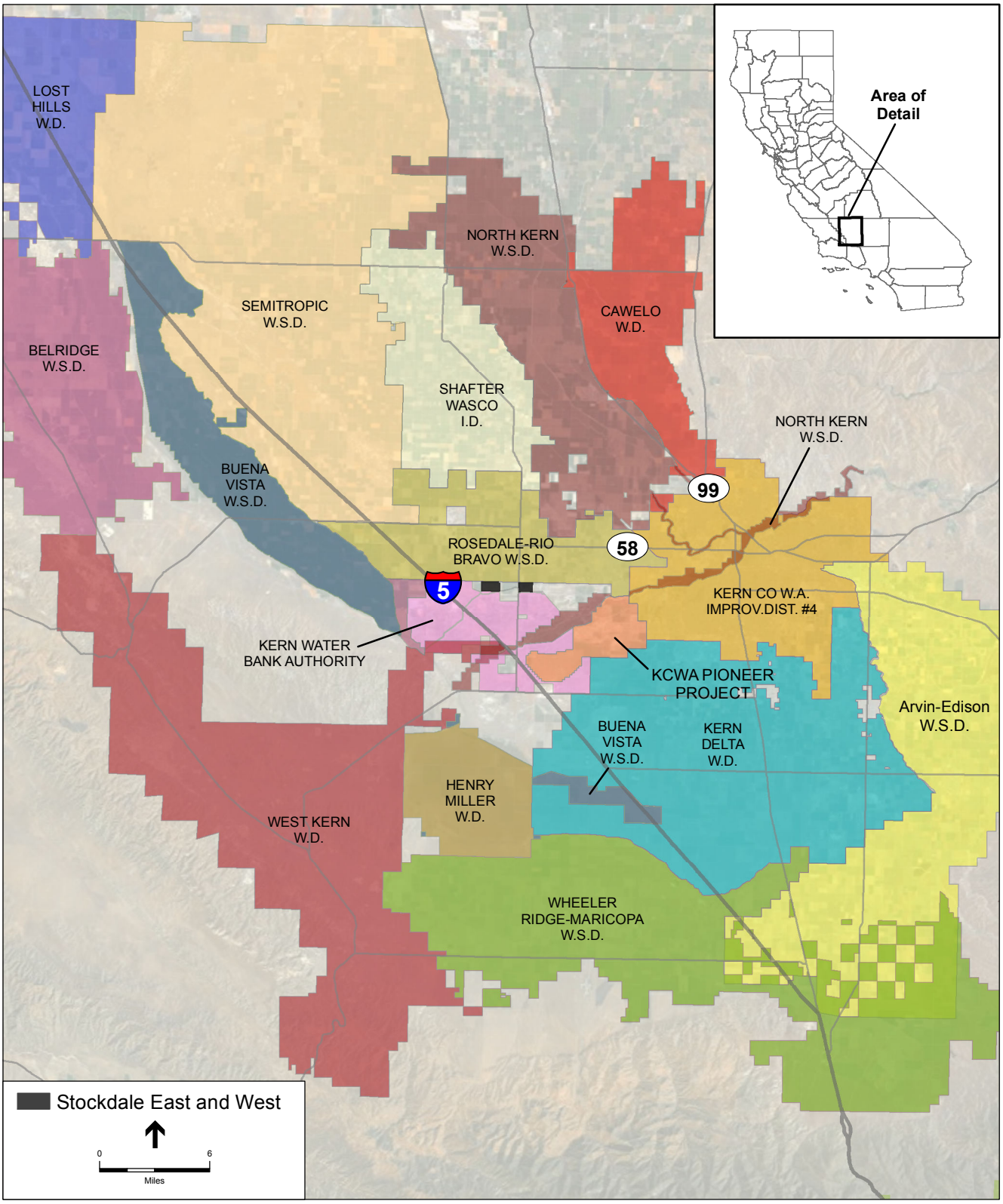
Groundwater banking involves recharging water, generally surface water, into an aquifer through wells or infiltration in ponds and channels and then pumping it out as necessary. The aquifer essentially functions as a water bank or underground reservoir. Deposits are made in times of surplus and withdrawals occur when available surface water falls short of demand. These groundwater banking programs have supplemented variable surface water supplies and increased reliability during drought years by providing for wet-year carryover. In addition, groundwater banking is accomplished by what is known as in-lieu banking where surface waters are provided in place of having a landowner pump groundwater for their water supply needs.

Because of the favorable conditions (e.g. large storage capacities and high permeable soils, etc.), numerous groundwater banking projects are operating in the Kern Fan region. Water districts and municipalities managing groundwater banking operations include the City of Bakersfield, Arvin-Edison Water Storage District (WSD), Semitropic WSD, Shafter Wasco Irrigation District (ID), North Kern WSD, Rosedale Ranch ID, Cawelo Water District, Improvement District 4, Kern Delta Water District, Henry Miller WD, Buena Vista WSD, Berrenda Mesa Water District, Kern County Water Agency (KCWA; Pioneer Project), Kern Water Bank Authority, West Kern Water District and the Rosedale-Rio Bravo WSD (Rosedale). **Figure 3.9-1** identifies the boundaries of the districts. Surface waters used for recharge are primarily from the Kern River, the State Water Project (SWP), or the Friant-Kern canal.

The City of Bakersfield was the first documented banking project with their property known as the 2,800-Acres Spreading Area. In the 1990s, banking programs were expanded with the construction of the Kern Water Bank, which includes 7,000 acres of recharge ponds and 13,000 acres of habitat/wildlife land, and the Kern County Water Agency's 2,200 acre Pioneer Banking Project, which was created for groundwater recharge and recovery operations (KCWA, 2007a). Many of these surrounding water districts have entered into a Memorandum of Understanding (MOU) that provides measures to protect the groundwater basin from overdraft, impairing water quality, or otherwise adversely affecting the basin or adjacent entities. The MOU includes details regarding minimum operating criteria, groundwater banking accounting practices, project monitoring responsibilities, and dispute resolution procedures. The MOU for the proposed project is briefly described in Chapter 1 and also included in Appendix B. In addition to the MOU, Rosedale has also developed the Long Term Operations Plan that implements the provisions of the MOU by designating specific measures to prevent, eliminate or mitigate significant adverse effects resulting from operation of the proposed project. The Long Term Operations Plan also is briefly described in Chapter 1 and included in Appendix B.

Groundwater Recovery

When a groundwater well is pumped, the aquifer surrounding the well responds with a pattern of drawdown known as a cone of depression. The radius and depth of the cone of depression depends on the hydrogeologic characteristics of the aquifer, pumping rate and duration of pumping in the pumping well. When pumping begins, the water level in the well initially begins to decline as water is removed from storage within the well and surrounding filter pack. For unconfined aquifers, the water level in the well then falls lower than the pre-pumping static condition, causing groundwater to begin to move towards the well. As pumping continues, the water level in the well continues to decrease until the rate of inflow equals the rate of withdrawal. Confined aquifers react a little differently, withdrawal from the well causes a reduction in aquifer pressure and because storage in a confined aquifer is small, the cone of depression expands rapidly and can be widespread. Area of influence formed by pumping an unconfined aquifer results in drainage of water from the sediments through which the water table declines as the cone of depression forms. In an unconfined aquifer, the cone of depression generally expands very slowly.



SOURCE: ESRI 2013, California Department of Water Resources

Stockdale Integrated Banking Project . 211181

Figure 3.9-1

Kern County Water Districts

A residual pumping depression due to drawdown of groundwater levels remains after pumping is discontinued and before the groundwater fully recovers. The shape of the residual pumping depression formed by groundwater recovery is influenced by the daily groundwater pumping schedule. Groundwater depressions change when groundwater wells are turned on and off to respond to varying demand. The residual pumping depression from cyclic pumping resembles the shape of a "pan" rather than a cone.

Regional Recovery Operations

Groundwater recovery in the Kern Fan area fluctuates from year to year and historically tends to be concentrated during the agricultural growing season of May to September. In some years such as 2006, no recovery operations associated with groundwater banking occurred for the region, and in 2005 only 4,740 AF were recovered. Going back to 1981, annual banking recovery operations for the Kern Fan region have fluctuated between zero and over 350,000 AF. Banking project operations have shifted the historic growing season pumping trend to often longer year-round operations.

Regional Recharge Operations

The Kern Fan has been identified as an excellent resource for groundwater banking operations due to its significant storage capacity and highly permeable overlying materials. The aquifer has been estimated to range in thickness from approximately 700 to 1,100 feet thick with some thicker areas in the east (KWBA, 2014). According to the Kern County Water Agency, the Kern County portion of the San Joaquin Valley's groundwater basin has about 10 million acre-feet of total available storage capacity (KWBA, 2014).

Volumetric recharge rates are controlled by the porosity and permeability of the subsurface materials and total pond area. Aquitards at depth can impede recharge efforts; however on the Kern Fan and in the project area, these layers impede but do not prevent recharge and recovery operations. The porosity of near surface soils tend to be very important to sustaining long term recharges operations. Pore spaces can eventually become clogged with finer grained material transported by the recharge water or by bio-growths found within the recharge water. Local project operators periodically scrape or treat their ponds to remove clogging deposits and encourage the growth of certain types of plants which keep the near-surface soil structure open and porous.

Groundwater Storage Capacity

For the purposes of artificial recharge projects, groundwater storage capacity is defined as the theoretical amount of groundwater that can be stored in an aquifer through surface recharge by direct or in-lieu means. The available aquifer storage capacity at any given time is estimated as the difference between the total storage capacity and the existing volume of groundwater storage. Groundwater levels in the Kern Fan Area have been observed to fluctuate significantly over time as a result of recharge and recovery operations. Thus, the available aquifer storage capacity in this area increases during periods of low groundwater levels and decreases during periods of high groundwater levels. As mentioned above, the total storage capacity of the San Joaquin Valley subbasin has been estimated by the Kern County Water Agency to be 40 million AF within the

Kern County portion of the subbasin, covering an area of approximately 1 million acres. Of this, approximately 10 million acre-feet of storage is available (KWBA, 2014).

Regional Groundwater Quality

The San Joaquin Valley Groundwater basin is generally characterized by calcium bicarbonate waters in the shallow zones in the eastern side of the subbasin with increasing sodium concentrations occurring with depth (DWR, 2006). Moving west, the bicarbonate levels are replaced by sulfate and chloride such that the west side of the subbasin contains primarily sodium sulfate and sodium sulfate characteristics. Total dissolved solids (TDS) concentrations average approximately 400 to 450 milligrams per liter (mg/L) with a total range of 150 to 5,000 mg/L (Kern County Water Agency as referenced in DWR, 2006). Shallow groundwater in some areas of the subbasin contains high TDS, sodium chloride, and sulfate concentrations. Areas typically associated with lakebed deposits show elevated concentrations of arsenic. Historic agricultural uses of the region have contributed to elevated concentrations of nitrate, 1,2-Dibromo-3-chloropropane (DBCP – a soil fumigant), and ethylene dibromide (EDB – a pesticide). Other natural concentrations found in the area of interest include α-particles, uranium, barium, boron, and zinc.

Most of the groundwater within the Kern Fan region originates as infiltration or recharge from Kern River surface water. The change in water chemistry between the surface waters of the Kern River and the groundwater occurs as a result of both natural and manmade factors. As the water naturally recharges through the sediments derived from the erosion of the granitic material from the Sierra Nevada mountain range, some constituents such as naturally occurring arsenic and radioactive elements are introduced into the water. Manmade sources of contaminants in the groundwater include agricultural practices, oilfield operations, and accidental spills from hazardous material use associated with commercial and industrial activity.

Project Setting

Topography

Stockdale East and Stockdale West are located approximately six miles west of Bakersfield. The two rectangle shaped project sites range in elevation from approximately 315 to 330 feet above mean sea level (amsl). Both sites are relatively flat with a very gentle slope towards the northwest. The third Stockdale site, to be identified within the radius shown in Figure 2-1, would be located at a similar elevation above mean sea level. The nearest natural surface water body to the project site is the Kern River which is located approximately two miles south. The CVC is located immediately south of Stockdale East and Stockdale West and the southern boundary of the third Stockdale site radius.

Project Site Hydrogeology

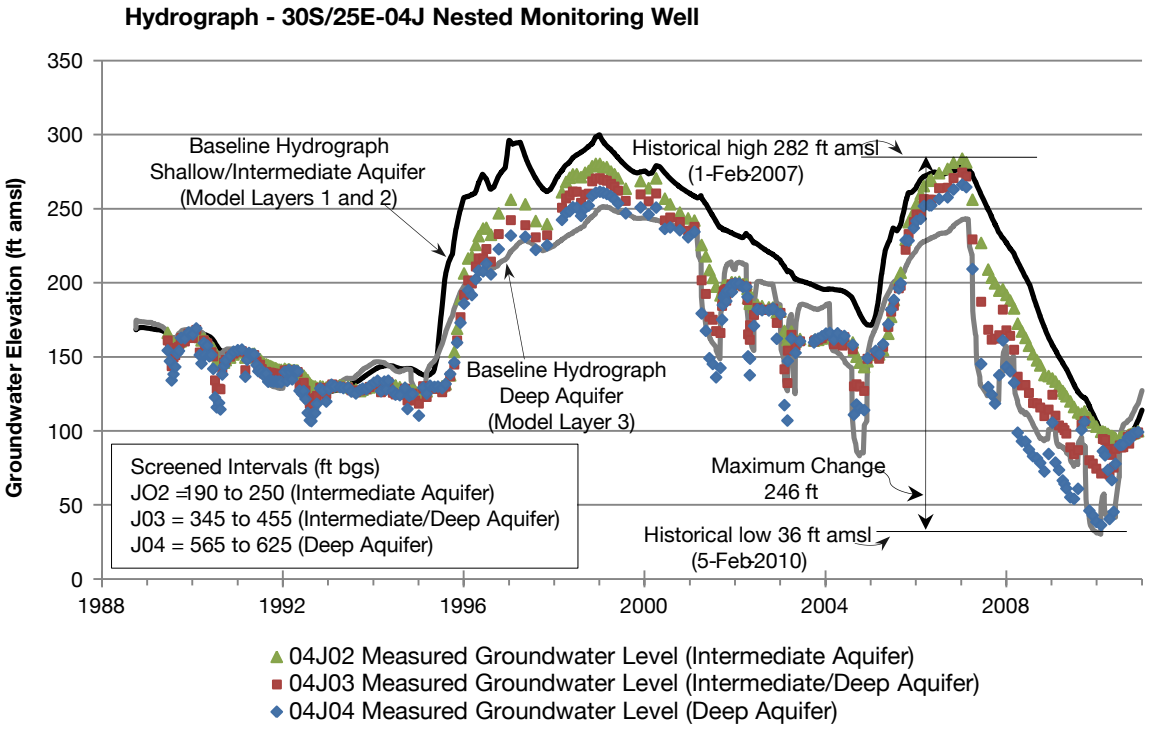
The aquifer characteristics of the project site are considered in general to be consistent with the Kern Fan region which is characterized by a stratified sequence of interbedded alluvial sand and silt that is approximately 700 feet thick. The 700-foot aquifer includes an approximate 100-foot thick shallow unconfined zone, a 250-foot middle zone, and a 350-foot deep semi-confined zone.

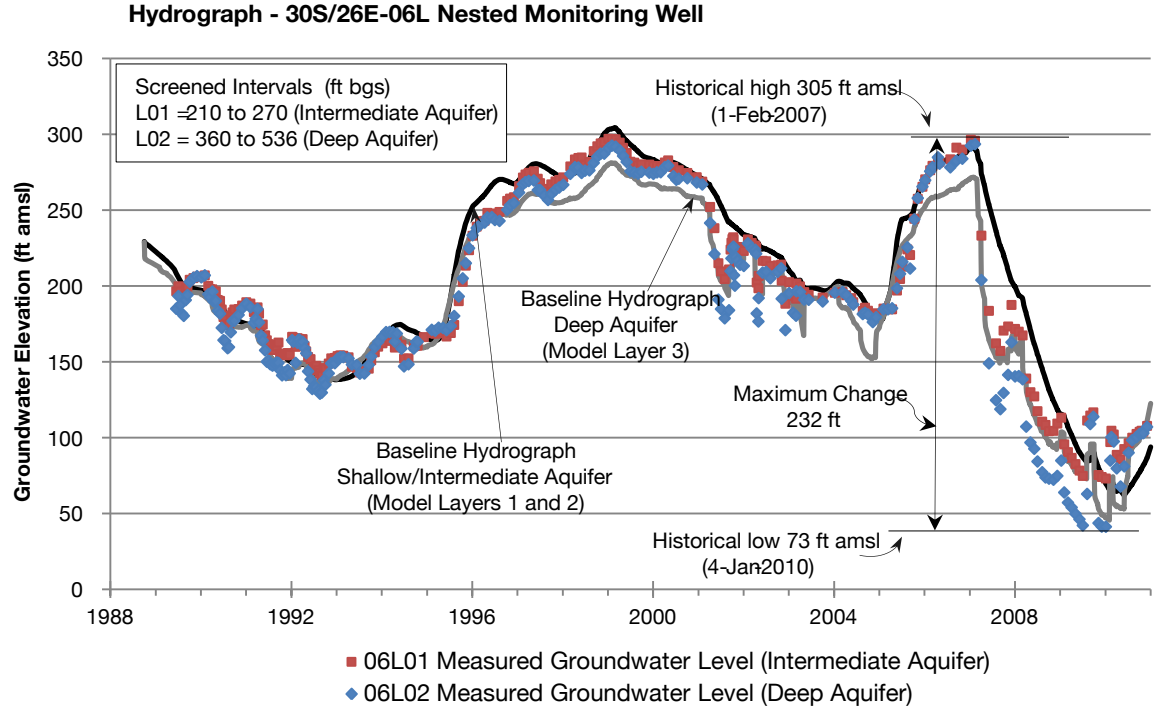
The Corcoran clay, which is present elsewhere in the valley, does not underlie the project area. The aquifer at depth is considered semi-confined due to the likely presence of finer-grained sediments which, where present, act to retard the vertical flow of groundwater. However, it should be emphasized that these sediments are not uniform across the area in terms of their grain size and hydrogeologic characteristics.

Significant changes in groundwater levels have occurred during the various recharge and recovery cycles in the project area since 1995 when the Kern Water Bank and Pioneer Project began operations. Extreme changes occurred between 2007 and 2010 when groundwater levels fluctuated as much as 246 feet between historical high levels in 2007 and historical low levels in 2010 (THC, 2015). These conditions have been recorded at nested monitoring wells in the project area where water levels fluctuated from highs of approximately 282 to 305 feet amsl to lows of approximately 36 to 73 feet amsl (**Figure 3.9-2**); given ground surface elevations are approximately 314 to 328 amsl at the monitoring well locations, this translates into high groundwater levels of approximately 31 to 32 feet below ground surface (bgs) and low groundwater levels of approximately 253 to 273 bgs. For the purpose of identifying the potential effects of the proposed project on a range of conditions, including historical low groundwater levels, the period from 2004 through 2010 is selected as the baseline on which to superimpose proposed recharge and recovery conditions in order to determine the greatest potential impacts on water levels, assuming the historical groundwater record represents the range of potential groundwater level conditions that could be expected in the future. The baseline historical groundwater conditions include recharge and recovery operations from nearby existing banking projects (e.g., Kern Water Bank, Pioneer Project, Rosedale-Rio Bravo Water Service District, etc.) including the more recently operating Strand Ranch Project.

Project Site Storage and Specific Yield

The Strand Ranch Project, located between Stockdale East and Stockdale West, has been operating as a groundwater recharge and recovery facility for the last few years. According to data for calendar year 2011, a total of 37,638 AF of water was delivered to the recharge basins (17,500 as part of IRWD and 20,138 for RRBWSD) (THC, 2015). For many of the months, the basins were filled to capacity and based on estimations, the recharge or infiltration rate for wetted conditions was 0.28 feet/day. Since 2011, approximately 53,800 AF of water has been delivered to the Strand Ranch Project. Analysis of pumping test data from extraction wells at the Strand Ranch facility also provided aquifer specific yield data that were used to estimate the total storage capacity directly beneath the Stockdale Properties. Specific yield is the ratio between the volume of water the aquifer will release from storage due to gravity drainage to the total volume of aquifer. As a result of the data derived from pumping tests on the Strand Ranch extraction wells, the total storage capacity for the Stockdale West site is estimated at 26,000 AF and 18,400 AF for Stockdale East (THC, 2015; see **Appendix E**) and approximately 51,200 AF for the third project site.





SOURCE: Thomas Harder & Co.

Stockdale Integrated Banking Project . 211181

Figure 3.9-2

Hydrographs - Nested Monitoring Wells

Project Site Groundwater Quality

Groundwater samples were collected from two existing agricultural wells on the Stockdale East and Stockdale West sites for analysis of different drinking water standards (THC, 2015; see Appendix E). One agricultural well is located in the southeast portion of Stockdale West, and one well is located in the south central portion of Stockdale East (see Figure 5 of Appendix E). Although the exact depths and perforation intervals of the wells are not known, they were assumed to be similar to other agricultural wells in the area which are generally 200 feet to 700 feet below ground surface (THC, 2015). Given their proximity to the identified radius of the third Stockdale site, they are also assumed to be reflective of quality constituents that would be experienced at the third site. According to laboratory results, the TDS concentrations ranged from 280 mg/L in the Stockdale East well to 400 mg/L in the Stockdale West well, both of which are below the regulatory guidance level of 500 mg/L otherwise known as the maximum contaminant level (MCL) for drinking water. Nitrate (as NO3-) was detected at concentrations ranging from 13.4 mg/L (Stockdale West) to 14.4 mg/L (Stockdale East) compared to an MCL of 45 mg/L. Arsenic was not detected in the samples and gross alpha was the only contaminant detected above its MCL; the sample from Stockdale West had a concentration of 18.9 picocuries per liter (pCi/L) and the sample from Stockdale East at 15 pCi/L compared to the MCL of 15 pCi/L. Of the total gross alpha, uranium accounted for approximately 10 to 11 pCi/L. However, the uranium concentration did not exceed its MCL of 20 pCi/L. Perchloroethene (PCE) and trichloroethene (TCE) were also detected in the sample from Stockdale East and EDB was detected in the sample from Stockdale West. However, these concentrations were all well below their respective MCLs.

Approximately 0.23 miles east of Stockdale East is the Hondo Chemical site, which houses industrial activities relating to the creation of fertilizer and soil amendments. Hondo Chemical was ordered by Kern County to make changes to operations and clean-up procedures to ensure environmental safety. According to SWRCB's Geotracker the site is classified as a "Land Disposal Site" (Global ID L10008056166). The clean-up status of the site is classified as open, and there are no potential contaminants of concern listed. Preliminary groundwater testing on the site in 2011showed no signs of contamination; there is a continuing effort to monitor the groundwater wells on the site, and no groundwater concerns have been found (Kern County, 2015). In 2014, Kern County submitted a notice of violation to the property owners, and a remediation work plan has been submitted (Kern County Local Enforcement Agency (LEA), 2015).

Erosion

Erosion and sedimentation are natural processes driven by surface runoff that can be accelerated by human activities such as construction earthwork activities. During construction, removal of vegetation or impervious areas (concrete, asphalt, etc.) expose soils to precipitation and surface runoff and can accelerate surface soil erosion. The process often results in loss of topsoil, creation of erosional features including rills and gullies, and sediment-filled streams and channels. Erosion potential is determined by four principal factors: the characteristics of the soil, extent of vegetative cover, topography, and climate. Soil texture and permeability determine the resistance of soil to entrainment by surface runoff. Vegetative cover plays a critical role in controlling

erosion by shielding and binding the soil. Slope influences the rate of runoff and is directly correlated with erosion potential where flatter topography has a much lower potential for erosion. The intensity and duration of rainfall determines the extent and the capacity for flowing water to detach and transport soil particles.

Excessive sedimentation may reduce channel or basin capacities and require increased dredging or cleaning of channels. Erosion along stream banks can erode nearby property, causing a loss of land or possibly increased flooding. Increased sedimentation can also restrict storm drains and channels and lead to flooding during storms that the drainage system should capably handle. In addition, development can increase the likelihood of erosion and sedimentation along unlined drainage channels as a result of increased storm water flows.

Flooding

A Flood Insurance Rate Map (FIRM) is the official map of a community prepared by the Federal Emergency Management Agency (FEMA) to delineate both the special flood hazard areas and the flood risk premium zones applicable to a community. FEMA has designated various 100-year and 500-year flood zones within the project area, which are generally associated with various creeks and drainages in the area. A 100-year flood has a one percent chance of occurring in a given year and while a 500-year flood has a 0.2 percent chance. FEMA designates flood zones using a series of letters, for example, Zone A indicate areas of the 100-year flood where base flood elevations are not known; Zone AE areas are those where 100-year flood elevations have been calculated; and Zone X areas that experience minimal flooding. Stockdale East and Stockdale West are located in a broad area that is designated as Zone X (FEMA, 2008). The radius for the third project site is also primarily Zone X, with one small areas designated as Zone A in the northwest corner of the radius boundary (FEMA, 2008).

3.9.2 Regulatory Setting

Federal

Clean Water Act

Regulatory authorities exist on both the state and federal levels for the control of water quality in California. The U.S. Environmental Protection Agency (EPA) is the federal agency, governed by the Clean Water Act (CWA), responsible for water quality management.

The purpose of the CWA is to protect and maintain the quality and integrity of the nation's waters by requiring states to develop and implement state water plans and policies. Section 303 of the CWA requires states to establish water quality standards consisting of designated beneficial uses of water bodies and water quality standards to protect those uses for all Waters of the United States. Under Section 303(d) of the CWA, states, territories and authorized tribes are required to develop lists of impaired waters. Impaired waters are the waters that do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires that these jurisdictions establish priority rankings for water on the lists and develop action plans to improve water quality. This process includes development of Total Maximum Daily Loads (TMDL) that set discharge limits for non-point

source pollutants. The recently passed Ducheny Bill (AB 1740) requires the SWRCB and its nine Regional Water Quality Control Boards to post this list and to provide an estimated completion date for each TMDL (SWRCB, 2003). The list is administered by the Regional Boards, in this case, Central Valley Regional Water Quality Control Board. The Kern River is not included in the 2010 California 303(d) List of Impaired Water Bodies (SWRCB, 2010).

Total Maximum Daily Load

California has identified waters that are polluted and need further attention to support their beneficial uses. These water bodies are listed under the CWA Section 303(d) list, which requires States to identify these polluted waters. Specifically, Section 303(d) requires that each state identify water bodies or segments of water bodies that are "impaired" (i.e., not meeting one or more of the water quality standards established by the state). Approximately 500 water bodies or segments have been listed in California. Once the water body or segment is listed, the state is required to establish "Total Maximum Daily Load" or TMDL for the pollutant causing the conditions of impairment. The TMDL is the quantity of a pollutant that can be safely assimilated by a water body without violating water quality standards. The EPA estimates that within the next 15 years, 40,000 TMDLs must be developed. At this time, the EPA has finalized only about eight TMDLs and four have been approved. Listing of a water body as impaired does not necessarily suggest that the pollutants are at levels considered hazardous to humans or aquatic life or that the water body segment cannot support the beneficial uses. The intent of the 303(d) list is to identify the water body as requiring future development of a TMDL to maintain water quality and reduce the potential for continued water quality degradation.

National Pollutant Discharge Elimination System

Part of the CWA provides for the National Pollutant Discharge Elimination System (NPDES), in which discharges into navigable waters are prohibited except in compliance with specified requirements and authorizations. Under this system, municipal and industrial facilities are required to obtain a NPDES permit that specifies allowable limits, based on available wastewater treatment technologies, for pollutant levels in their effluent. In California, the EPA has delegated the implementation of this program to the State Board and to the Regional Boards.

Storm water discharges are regulated somewhat differently. Storm water runoff from construction areas of one acre or more require either an individual permit or coverage under the statewide General Construction Storm Water Permit. In addition, specific industries, including waste water treatment plants that have direct storm water discharges to navigable waters are required to obtain either an individual permit issued by the Regional Board, or obtain coverage under the statewide General Industrial Storm Water Permit for storm water discharges.

A non-point source is a diffused source, such as land runoff, precipitation, deposit from the atmosphere, or percolation. Major non-point sources of water pollution are agriculture, mining, oil and gas extraction, pastureland and feedlots, land disposal, and urban runoff. For non-point sources, the Basin Plan outlines the approach that the Regional Board has taken to control non-point source pollution in its Urban Runoff Management scheme. Part of the strategy involves the

permitting of storm water discharges from all facilities associated with industrial activities and from all construction activities that result in the disturbance of land totaling one acre or more.

Federal Emergency Management Agency

Under Executive Order 11988, FEMA is responsible for the management and mapping of areas subject to flooding during a 100-year flood event (i.e., one percent chance of occurring in a given year). FEMA requires that local governments covered by federal flood insurance pass and enforce a floodplain management ordinance that specifies minimum requirements for any construction within the 100-year flood plain, as depicted on FEMA maps.

State

State Water Resources Control Board

SWRCB, located in Sacramento, is the agency with jurisdiction over water quality issues in the State of California. The SWRCB is governed by the Porter-Cologne Water Quality Act (Division 7 of the California Water Code), which establishes the legal framework for water quality control activities by the SWRCB. The intent of the Porter-Cologne Act is to regulate factors which may affect the quality of waters of the State to attain the highest quality which is reasonable, considering a full range of demands and values. Much of the implementation of the SWRCB's responsibilities is delegated to its nine Regional Boards. The project site is located within the Central Valley Region.

Regional Water Quality Control Board, Central Valley Region

The Central Valley RWQCB is responsible for the protection of beneficial uses of water resources within the Central Valley Region. The RWQCB uses planning, permitting, and enforcement authorities to meet this responsibility, and adopted the Water Quality Control Plan for the Tulare Lake Basin (Basin Plan) second edition on January, 2004, which was approved by the SWRCB and the Office of Administrative Law. (The Tulare Lake Basin Plan covers only the southern portion of the Central Valley region. The Central Valley Regional Water Quality Control Board has produced a separate basin plan for the Sacramento and San Joaquin Valley regions.)This updated and consolidated plan represents the Regional Board's master water quality control planning document. The Basin Plan comprehensive program requirements are designed to be consistent with federal regulations (40 CFR Parts 122-124) and are implemented through issuance of NPDES permits to point source and non-point sources of pollutant discharges including construction activities. The Basin Plan identifies beneficial uses and establishes water quality objectives for surface waters in the Region, as well as effluent limitations and discharge prohibitions intended to protect those uses.

Construction Activity Permitting

The California Construction Stormwater Permit (Construction General Permit) (*General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities*, Order No. 2009-0009-DWQ, as amended by Order No. 2010-0014-DWQ, National Pollutant Discharge Elimination System No. CAS000002), adopted by the SWRCB, regulates construction activities that include clearing, grading, and excavation resulting in soil disturbance of at least

one acre of total land area. The Construction General Permit authorizes the discharge of storm water to surface waters from construction activities. It prohibits the discharge of materials other than storm water and authorized non-storm water discharges and all discharges that contain a hazardous substance in excess of reportable quantities established at 40 Code of Federal Regulations 117.3 or 40 Code of Federal Regulations 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.

The Construction General Permit requires that all developers of land where construction activities will occur over more than one acre do the following:

- Complete a Risk Assessment to determine pollution prevention requirements pursuant to the three Risk Levels established in the General Permit;
- Eliminate or reduce non-storm water discharges to storm sewer systems and other waters of the Nation;
- Develop and implement a Stormwater Pollution Prevention Plan (SWPPP), which specifies best management practices (BMP) that will reduce pollution in storm water discharges to the Best Available Technology Economically Achievable/Best Conventional Pollutant Control Technology standards; and
- Perform inspections and maintenance of all BMPs.

In order to obtain coverage under the NPDES Construction General Permit, the Legally Responsible Person must electronically file all Permit Registration Documents with the SWRCB prior to the start of construction. Permit Registration Documents must include:

- Notice of Intent;
- Risk Assessment;
- Site Map;
- SWPPP;
- Annual Fee; and
- Signed Certification Statement.

Typical BMPs contained in SWPPPs are designed to minimize erosion during construction, stabilize construction areas, control sediment, control pollutants from construction materials, and address post construction runoff quantity (volume) and quality (treatment). The SWPPP must also include a discussion of the program to inspect and maintain all BMPs.

California Toxics Rule

The EPA is responsible for implementing federal laws designed to protect air, water, and land. EPA has developed national water quality standards in accordance with the CWA and these standards are used to determine the amount and the conditions under which pollutants can be discharged. The EPA published the California Toxics Rule (CTR) in the Federal Register (FR) establishing water quality standards for toxic pollutants for California waters (FR 31681). On

April 28, 2000 the Office of Administrative Law approved the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Plan [SIP]). The State Water Resources Control Board (SWRCB) adopted the policy in March 2000. The SIP establishes the implementation policy for all toxic pollutants.

California Department of Pesticide Regulation – Restricted Materials Permits and Pesticide Use Report (PUR)

The California Department of Pesticide Regulation (CDPR) is dedicated to protect human health and the environment by regulating pesticide sales and use, and by fostering reduced-risk pest management. The State of California maintains a list of pesticides that are especially dangerous to human health or the environment if used incorrectly, commonly called restricted materials. These pesticides are listed in 3 CCR 6400. CDPR puts special controls and limitations on these pesticides; furthermore, the purchase or use of restricted materials for agricultural purposes requires a permit from the CAC. Use requirements for these pesticides are given in 3 CCR 6445 through 6489.

CDPR maintains a list of registered pesticides known to cause groundwater contamination in California; these pesticides are listed in Title 3, California Code of Regulations (3 CCR), Section 6800(a): atrazine, bantazon, bromacil, diuron, norflurazon, prometon, simazine. Section 6800(a) pesticides have certain use restrictions. Section 6800(a) pesticides are prohibited below the high water mark inside artificial recharge basins, unless the pesticide is applied six months or more before the basin is used to recharge groundwater (3 CCR Section 6487.1).

CDPR also maintains a list of pesticides that have the potential to move to, but are not currently found in groundwater, listed in 3 CCR 6800(b). Section 6800(b) pesticides are not prohibited for use in artificial recharge basins (CDPR, 2009).

CDPR also has regulations pertaining to wellhead protection and the use of pesticides, as listed in 3 CCR 6609 (CDPR, 2009). These measures apply to all wells (irrigation, domestic, municipal, monitoring, abandoned, dry, or drainage wells) where pesticides are mixed, loaded, rinsed, or otherwise used within 100 feet of the well. The following management measures are given by CDPR to protect wellheads:

- Wells protected from runoff:
  - The well should be sited so that no surface water runoff can contact the wellhead including the concrete base, or;
  - A berm should be constructed adjacent to the wellhead to prevent movement of surface water to the wellhead. Preemergent herbicides from the 6800(a) and 6800 (b) lists are prohibited between the berm and the wellhead.
- Wells not protected from runoff: The following activities are prohibited within 100 feet of an unprotected well:
  - Mixing, loading, and storing pesticides,

- Rinsing of spray equipment or pesticide containers,
- Maintenance of spray equipment that could result in a pesticide or pesticide residue spill,
- Application of preemergent herbicides from the 6800(a) and 6800 (b) lists.

California became the first state to require full reporting of agricultural pesticide use in response to demands for more realistic and comprehensive pesticide use data. Under the PUR program, all agricultural pesticide use must be reported monthly to county agricultural commissioners, who in turn, report the data to CDPR.

Sustainable Groundwater Management Act of 2014

The Sustainable Groundwater Management Act of 2014 (SGMA) is a three-bill package that collectively establishes a new structure for managing California's groundwater. A central feature of the SGMA is the recognition that groundwater management in California is best accomplished locally. The SGMA was signed by Governor Edmund G. Brown Jr. on September 16, 2014, and includes the provisions of Senate Bill (SB) 1168, Assembly Bill (AB) 1739, and SB 1319. The SGMA builds upon the existing groundwater management provisions established by AB 3030 (1992), SB 1938 (2002), and AB 359 (2011), as well as SBX7 6 (2009) which established the California Statewide Groundwater Elevation Monitoring (CASGEM) Program.

The SGMA requires the formation of locally-controlled Groundwater Sustainability Agencies (GSAs) which must develop Groundwater Sustainability Plans (GSPs) in groundwater basins or subbasins that DWR designates as medium or high priority. The proposed project is located in the Tulare Lake Basin of the San Joaquin Valley Groundwater Basin, which is classified as a high-priority basin (CASGEM, 2014). GSAs must be formed by June 30, 2017; GSPs must be developed by January 31, 2020 for high-priority basins that DWR determines to be in critical overdraft, and by January 31, 2022 for all other high-priority basins. Sustainability must be achieved in high-priority basins within 20 years from the date of GSP adoption.

A GSA may appropriate and acquire surface water or groundwater; may appropriate and acquire surface water or groundwater rights; may import surface water or groundwater; and may conserve and store within or outside the agency that water for any purpose necessary to carry out is obligations under the SGMA. "As part of this authority, the agency shall not alter another person's or agency's existing groundwater conjunctive use or storage program except upon a finding that the conjunctive use or storage program interferes with implementation of the agency's groundwater sustainability plan" (CWC Section 10726(b)). Additionally, the GSP must include, "where appropriate and in collaboration with the appropriate local agencies, [a]ctivities implementing, opportunities for, and removing impediments to, conjunctive use or underground storage" (CWC Section 10727.4(f)).

The SGMA defines sustainable groundwater management as "*the management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results.*" Undesirable results include, but are not limited to,

chronic lowering of groundwater levels, reduction of groundwater storage, seawater intrusion, degraded water quality, and land subsidence that interferes with surface land uses. The legislative intent of the SGMA is to achieve all of the following:

- To provide for the sustainable management of groundwater basins.
- To enhance local management of groundwater consistent with 1) rights to use or store groundwater and 2) Section 2 of Article X of the California Constitution.
- To establish minimum standards for sustainable groundwater management.
- To provide local groundwater agencies with the authority and the technical and financial assistance necessary to sustainably manage groundwater.
- To avoid or minimize subsidence.
- To improve data collection and understanding about groundwater.
- To increase groundwater storage and remove impediments to recharge.
- To manage groundwater basins through the actions of local governmental agencies to the greatest extent feasible, while minimizing state intervention.

Local

Kern County General Plan

The Kern County General Plan includes elements to protect the groundwater and surface water resources of the county through various goals and policies. The following policies would apply to the proposed project:

- Encourage the development of the County's groundwater supply to sustain and ensure water quality and quantity for existing users, planned growth, and maintenance of the natural environment.
- The Kern County Environmental Health Services Department will develop guidelines for the protection of groundwater quality which will include comprehensive well construction standards and the promotion of groundwater protection for identified degraded watersheds.
- Encourage effective groundwater resource management for the long-term benefit of the County through the following:
  - Promote groundwater recharge activities in various zone districts.
  - Support for the development of Urban Water Management Plans and promote Department of Water Resources grant funding for all water providers.
  - Support the development of Groundwater Management Plans.
  - Support the development of future sources of additional surface water and groundwater, including conjunctive use, recycled water, conservation, additional storage of surface water, and groundwater and desalination.

Kern County Code - Water Well Ordinance

Title 14 Section 14.08 of the Kern County Code covers Water Well Systems and includes well construction standards and permitting procedures. The well construction standards include reference to the adoption of State Department of Water Resources well construction standards found in Bulletin 74-81 which was amended with Bulletin 74-90.

Kern County Floodplain Management Ordinance

Kern County has adopted regulations designed to promote the public health, safety, and general welfare of its citizenry by minimizing public and private losses due to flood conditions. The Kern County Floodplain Management Ordinance (Kern County Code Section 17.48) restricts land use and development that are vulnerable to floods or water erosion hazards or that would divert flood waters or increase flood hazards in other areas. The Ordinance also requires that uses vulnerable to floods be protected against flood damage and controls the alteration of natural floodplains. The Ordinance requires a development permit prior to construction within any area of special flood hazards. The Ordinance prohibits the encroachment of new development into areas of special flood hazard, such as those classified on FEMA flood hazard maps, unless a registered professional engineer or architect certifies and demonstrates that no increase in flood levels will occur during a base flood discharge (Kern County Code Section 17.48.320).

3.9.3 Impact Assessment

Thresholds of Significance

The following criteria from Appendix G of the *CEQA Guidelines* are used as thresholds of significance to determine the impacts of the proposed project as related to hydrology and water quality. The proposed project would have a significant impact if it would:

1. Violate any water quality standards or waste discharge requirements.
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).
3. Substantially alter the existing drainage pattern of a site or area through the alteration of the course of a stream or river, or by other means, in a manner that would result in substantial erosion or siltation on- or off-site.
4. Substantially alter the existing drainage pattern of a site or area through the alteration of the course of a stream or river, or by other means, substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site.
5. 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.
6. Otherwise substantially degrade water quality.

7. 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.
8. Place within a 100-year flood hazard area structures that would impede or redirect flood flows.
9. 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.
10. Expose people or structures to a significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow.

Effects Found Not to be Significant

Threshold 4. Alter Drainage to Cause Flooding

The proposed project would be designed to provide infiltration of surface water within the recharge basins at the Stockdale Properties. Storm water runoff would be captured onsite and therefore would not cause or exacerbate any potential flooding on- or off-site. The Central Intake Pipeline would be underground and once installed there would be no change in surface runoff as the alignment would continue to be maintained primarily as a dirt roadway, similar to existing conditions. Therefore, there would be no impact.

Threshold 5. Exceed Capacity of Drainage System

The proposed project would not create or contribute new sources of runoff or polluted runoff. The proposed project would be designed to provide infiltration of surface waters within the recharge basins at the Stockdale Properties and as such would capture storm water runoff onsite. No drainage system would be necessary for storm water capture. The Central Intake Pipeline would be underground and once installed there would be no change in surface runoff as the alignment would continue to be maintained primarily as a dirt roadway, similar to existing conditions. Therefore, there would be no impact.

Threshold 7. Housing in a Flood Hazard Area

The proposed project does not include the construction or renovation of any housing units. Therefore, the proposed project would have no impact on housing or structures due to flood flow.

Threshold 9. Failure of a Levee or Dam

The project sites are not located within an inundation area for any levees or dams. The perimeter berms of the recharge ponds would be compacted and constructed to minimize any potential damage that may occur. In the event that damage occurs to the berms during times when the ponds are full, released water would likely infiltrate into the permeable soils that comprise the relatively flat area surrounding the project site. Therefore there would be no impact to people or structures related to potential risk of loss, injury or death involving flooding from the failure of a levee or dam.

Threshold 10. Seiche, Tsunami, or Mudflow

The project sites are not located in an area that is susceptible to the effects of a seiche, tsunami or mudflow. Therefore there would be no impact to people or structures related to potential risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow.

Impacts and Mitigation Measures

Threshold 1. Water Quality Standards

Impact HYDRO-1: The proposed project could violate water quality standards or waste discharge requirements during construction or project operation.

Construction

Construction of the proposed project would require excavation, grading and recontouring of the soils at the project sites. During these activities, soils could be become exposed to high winds or heavy precipitation causing a substantial increase in sedimentation in storm water run-off and loss of topsoil. In addition, construction activities would require the use of hazardous materials including but not limited to petroleum products (i.e. oil, gasoline, and diesel fuels) and automotive fluids (i.e. antifreeze and hydraulic fluids). Inadvertent spills or leaks of such pollutants could affect the quality of runoff water from the construction sites. However, because the project would disturb more than one acre, construction would be subject to the NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (General Construction Permit). As part of this process, Rosedale would file a Notice of Intent with SWRCB, in compliance with the statewide NPDES General Construction Permit. Rosedale would be required to prepare and submit a SWPPP that would identify pollutant sources that may affect the quality of storm water discharge and identify BMPs, such as erosion control and pollution prevention measures, to be used during the course of construction.

Operation

Recharge water for the proposed project would be secured and acquired from various sources, potentially including high-flow Kern River water (depending on annual availability), pre-1914 and post-1914 appropriative water rights, the CVP, and the SWP. When available, this recharge water would be allowed to infiltrate into the underlying groundwater aquifer for later extraction. Once extracted, the groundwater would be introduced into the CVC and the California Aqueduct and would be subject to the pump-in water quality requirements imposed by the KCWA and DWR. Prior to pumping extracted groundwater into the CVC and California Aqueduct, it would be IRWD's and Rosedale's responsibility to ensure that the water quality was sufficient to meet KCWA and DWR requirements. Any water that did not meet water quality requirements, or could not be blended to meet such requirements, as imposed by the conveyance facility operators would not be conveyed within the canals. Based on preliminary sampling results, the underlying groundwater is mostly within drinking water standards, and the only constituent that was found to be above the drinking water MCLs was gross alpha which is a known regional issue. However, the gross alpha concentrations detected were not substantially above the MCL of 15 pi/L and the underlying groundwater quality would likely benefit from the high quality surface water used for recharging (THC, 2015).

Impact Determination

The project SWPPP would include BMPs to minimize the impacts of construction activities to water quality. With implementation of the BMP requirements in **Mitigation Measure HYDRO-1**, the potential for pollutants and sediment to affect the water quality of runoff from construction sites would be minimized to less-than-significant levels.

The proposed recharge activities would likely improve underlying groundwater quality through the blending of high quality surface water such that no adverse effect on water quality would be anticipated. In addition, the pump-in water quality requirements would ensure that water introduced into the CVC and California Aqueduct would meet KCWA and DWR requirements.

Significance Conclusion

Less than Significant with Mitigation.

Mitigation Measures

HYDRO-1: The SWPPP for the proposed project shall include the following BMPs:

- Establish an erosion control perimeter around active construction and contractor layout areas, using methods such as silt fencing, jute netting, straw waddles, or other appropriate measures to control sediment from leaving the construction area.
- Stockpiled soils shall be watered, covered, or otherwise managed to prevent loss due to water and wind erosion.
- Install containment measures at fueling stations and at fuel and chemical storage sites.
- Employ good house-keeping measures including clearing construction debris and waste materials at the end of each day.

Threshold 2. Groundwater Supplies

Impact HYDRO-2: The proposed project could deplete groundwater supplies and lower the groundwater table through extraction of banked groundwater.

The proposed project would affect existing groundwater levels through proposed water recharge and recovery activities. During periods when surface water is available for artificial recharge, water would be delivered to the recharge basins for infiltration and storage underground. Following recharge activities, stored groundwater would be pumped out and delivered for offsite water usage. Extraction would be limited to the amount previously recharged less losses, to be specified in agreements between IRWD and Rosedale.

A groundwater analysis was conducted for the proposed project to estimate the potential effects of the proposed recharge and recovery operations at Stockdale East and Stockdale West on groundwater levels (THC, 2015; see Appendix E). As discussed above, for the purpose of identifying the potential effects on a representative range of groundwater conditions, particularly the maximum potential effects, 2004 to 2010 was selected as the baseline on which to

superimpose proposed recharge and recovery conditions in order to determine the greatest potential impacts on water levels. Groundwater flow model simulations were developed for potential recharge efforts during high groundwater conditions, and potential pumping during both low (2004) and historical low (2009-2010) groundwater conditions (THC, 2015). The analysis was conducted using a calibrated three-dimensional numerical groundwater flow model previously developed for a large portion of the Kern River Fan area west of Bakersfield (THC, 2015). The project area boundaries are completely within the model area (see Appendix E, Figure 1). For this effort, estimated monthly artificial recharge and groundwater production associated with the project was superimposed on a portion of the historical groundwater record that is a representative range of potential groundwater level conditions that could be expected in the future. It is noted that preliminary information for groundwater elevations from 2014 indicates that these historic lows may have been met or exceeded, given the current and ongoing drought conditions (Kern Fan Monitoring Committee, 2015).

The analysis assumed groundwater pumping would occur on Stockdale East and Stockdale West at a rate of 2800 gpm, per the proposed project design, to achieve the proposed annual recovery at each site, which would be 7,500 AFY at Stockdale East and 11,250 AFY at Stockdale West. A summary table showing all model-predicted groundwater level changes that would result due to project recovery is shown in Table 6 of Appendix E, and is replicated below as **Table 3.9-1**.

During low groundwater conditions, as simulated based on conditions observed in 2004 (between February 2004 and November 2004), project groundwater pumping is predicted to result in a maximum drawdown of approximately 18 feet in the shallow/intermediate aquifer directly below Stockdale East and approximately 24 feet in the deep aquifer. Maximum drawdown of approximately 24 feet would occur in the shallow/intermediate aquifer directly below Stockdale West and approximately 34 feet in the deep aquifer. Maximum pumping interference at the nearest wells outside of the project sites would be represented by the modeled project-related drawdown at such wells. Maximum drawdown at the nearest production well, which would be the Kern Water Bank Well 6D03 just south of Stockdale West and north of the CVC, is predicted to be approximately 17 feet in the shallow/intermediate aquifer and 27 feet in the deep aquifer. Maximum drawdown at the nearest existing private wells to Stockdale East would be approximately 14 feet in the shallow/intermediate aquifer and 20 feet in the deep aquifer. For the nearest existing private wells to Stockdale West, maximum drawdown would be approximately 18 feet in the shallow/intermediate aquifer and 28 feet in the deep aquifer. Modeling results indicate that groundwater drawdown will recover relatively rapidly following a period of pumping to within five feet of pre-recharge levels within six months for the shallow and intermediate aquifers and only three months for the deep aquifer (THC, 2015).

Using the historical low conditions, as simulated based on conditions observed between September 2009 and June 2010, project-related groundwater pumping is predicted to result in only slightly greater drawdown in the deep aquifer below both sites; a greater change is predicted in the shallow/intermediate aquifer, with drawdown of approximately 27 feet below Stockdale East and 31 feet below Stockdale West. Maximum well interference would be approximately

TABLE 3.9-1
SUMMARY OF MAXIMUM MODEL-PREDICTED GROUNDWATER LEVEL CHANGE

			Maximum Change in Groundwater Level (ft)	
Scenario	**Project**	**Point of Reference Location**	**Shallow and Intermediate Aquifer**	**Deep Aquifer**
Scenario 1 (Recharge)	Stockdale West	Basin Center	34.9	6.9
		Cross Valley Canal	29.7	7.0
	Stockdale East	Basin Center	28.9	9.0
		Cross Valley Canal	24.2	9.0
	Strand Ranch	Basin Center	20.7	7.9
Scenario 2 (Pumping during Low Groundwater Conditions)	Stockdale West	Basin Center	-23.9	-33.5
		Nearest Production Well	-16.7	-26.9
		Nearest Private Well	-17.5	-28.0
	Stockdale East	Basin Center	-18.4	-24.3
		Nearest Production Well	-10.8	-16.6
		Nearest Private Well	-13.5	-19.6
	Strand Ranch	Basin Center	-12.6	-21.5
Scenario 3 (Pumping during Historical Low Groundwater Conditions)	Stockdale West	Basin Center	-31.3	-34.4
		Nearest Production Well	-21.4	-27.7
		Nearest Private Well	-20.7	-28.7
	Stockdale East	Basin Center	-27.2	-25.9
		Nearest Production Well	-15.3	-17.8
		Nearest Private Well	-15.7	-20.5
	Strand Ranch	Basin Center	-15.2	-22.6

SOURCE: Thomas Harder & Co., January 2015.

28 feet in the deep aquifer at the nearest production well offsite (Kern Water Bank Well 6D03); 21 feet in the deep aquifer at the nearest private wells to Stockdale East; and 29 feet in the deep aquifer at the nearest private wells to Stockdale West. Recovery after pumping would occur at similar levels to the low groundwater conditions scenario. Modeling results indicate that groundwater drawdown will recover relatively rapidly following a period of pumping to within eight feet of pre-recharge levels within six months for the shallow and intermediate aquifers; groundwater levels would recover to within five feet of pre-recharge levels within the deep aquifer within three months after pumping is stopped (THC, 2015).

Impact Determination

Based on the three-dimensional modeling results for the project under low conditions and historical low groundwater conditions, and relative to the baseline established using the historical groundwater record augmented with simulations of the Strand Ranch Project, the proposed groundwater recovery operations at Stockdale East and Stockdale West would have a maximum

drawdown at neighboring wells of approximately 21 and 29 feet, respectively. This interference would occur in the deep aquifer; effects of project-related pumping in the shallow/intermediate aquifer would be consistently less, with maximum drawdown of approximately 16 and 21 feet at the nearest wells to Stockdale East and Stockdale West, respectively (Table 3.9-1).

Considering that historical fluctuations in groundwater levels for the project area have been measured up to 246 feet, these model-predicted drawdowns associated with project operation are well within normal fluctuations. During certain years and groundwater conditions, additional drawdown between 16 and 29 feet may have no adverse effects on pre-existing nearby wells and their ability to produce water to support existing or planned land uses. Such would be the case if the additional drawdown resulted in groundwater levels at or above historic lows. Potentially significant impacts would occur if project operations lowered groundwater levels below historical low conditions. In this situation, the analysis of impacts depends on the depth of the affected wells and whether the project-related drawdown would further lower groundwater levels to a depth that affects the ability of neighboring wells to produce water.

Most wells owned by private landowners, such as those to the north of Stockdale East and Stockdale West, have screens that are perforated in the shallow/intermediate aquifer (THC, 2015), typically up to approximately 400 feet bgs and produce water at low rates satisfactory for rural water use. During historical low groundwater conditions, water levels in the shallow/intermediate aquifers in the project vicinity were approximately 75 feet amsl (Figure 3.9-2), which is approximately 240 feet bgs assuming the ground surface elevation is approximately 315 feet amsl. The proposed project would result in additional maximum drawdown of approximately 21 feet in the shallow/intermediate aquifer, which would lower groundwater levels to 261 feet bgs under historical low conditions. Assuming typical private landowner well depths range between 300 to 400 feet bgs, the proposed project would leave between approximately 40 to 140 feet of exposed screen, which would provide adequate flow to support operation at low production rates. Therefore, project operation is not expected to have a significant effect on operation of neighboring private landowner wells under historical low groundwater conditions.

Most production wells operated by water districts have screens that are perforated in the deep aquifer (THC, 2015) up to approximately 700 feet bgs. The Kern Water Bank well 6D03, which is the closest production well to the project site, is screened in the deep aquifer up to approximately 704 feet bgs. During historical low groundwater conditions, water levels in the deep aquifers in the project vicinity were approximately 36 feet amsl (Figure 3.9-2), which is approximately 279 feet bgs assuming the ground surface elevation is approximately 315 feet amsl. The proposed project would result in additional maximum drawdown of approximately 29 feet in the deep aquifer, which would lower groundwater levels to 308 feet bgs under historical low conditions. This groundwater level is higher than the typical production well depth of 700 feet bgs, including the KWB well 6D03. Therefore, project operation is not expected to have a significant effect on operation of neighboring production wells under historical low groundwater conditions.

Based on the CEQA significance criteria, the proposed project would not 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 that would not support existing land uses or planned uses for which permits have been granted). Therefore the environmental impacts would be considered less than significant. No mitigation measures would be required.

Additionally, as described previously in Chapter 1 and 2, and further in Chapter 4, the proposed project would be operated subject to, and in accordance with, Rosedale's MOUs with adjoining entities in the Kern Fan area and the complementary Long Term Operations Plan. The Long Term Operations Plan designates specific measures to be employed to "prevent, eliminate or mitigate significant adverse impacts" resulting from project operation, including effects to neighboring wells. The Long Term Operations Plan includes monitoring of groundwater conditions and the use of Rosedale's Groundwater Model to annually predict the contribution of Rosedale's projects to groundwater declines in the area. The Plan defines when such Project Conditions constitute a negative project impact (NPI) relative to No-Project Conditions. The Plan also establishes the NPI that would trigger implementation of mitigation measures, such as when the Groundwater Model predicts groundwater levels that would result in mechanical failure or other operational problems at neighboring wells. The Plan includes mitigation measures to be implemented for different categories of wells, such as providing compensation to lower the well pump; reducing or adjusting pumping to prevent, avoid, or eliminate the NPI; or drilling a new well.

Significance Conclusion

Less than Significant.

Mitigation Measures

None required.

Impact HYDRO-3: Recharge operations on the proposed project site could result in groundwater mounding that could potentially impact underground structures or impair recharge efforts of adjacent groundwater banking operations.

During periods of shallow groundwater, underground structures such as support structures of the CVC, or other sub-surface infrastructure could be damaged by upward pressure caused by rising groundwater. The CVC is below grade at Stockdale West and above grade at Stockdale East; and some support structures may extend below grade. The CVC may be proximate to the third Stockdale site given the site radius. Mounding groundwater resulting from natural conditions, off-site recharging, or recharging on the project sites could impact the integrity of these structures or cause cracks in sub-surface concrete panels.

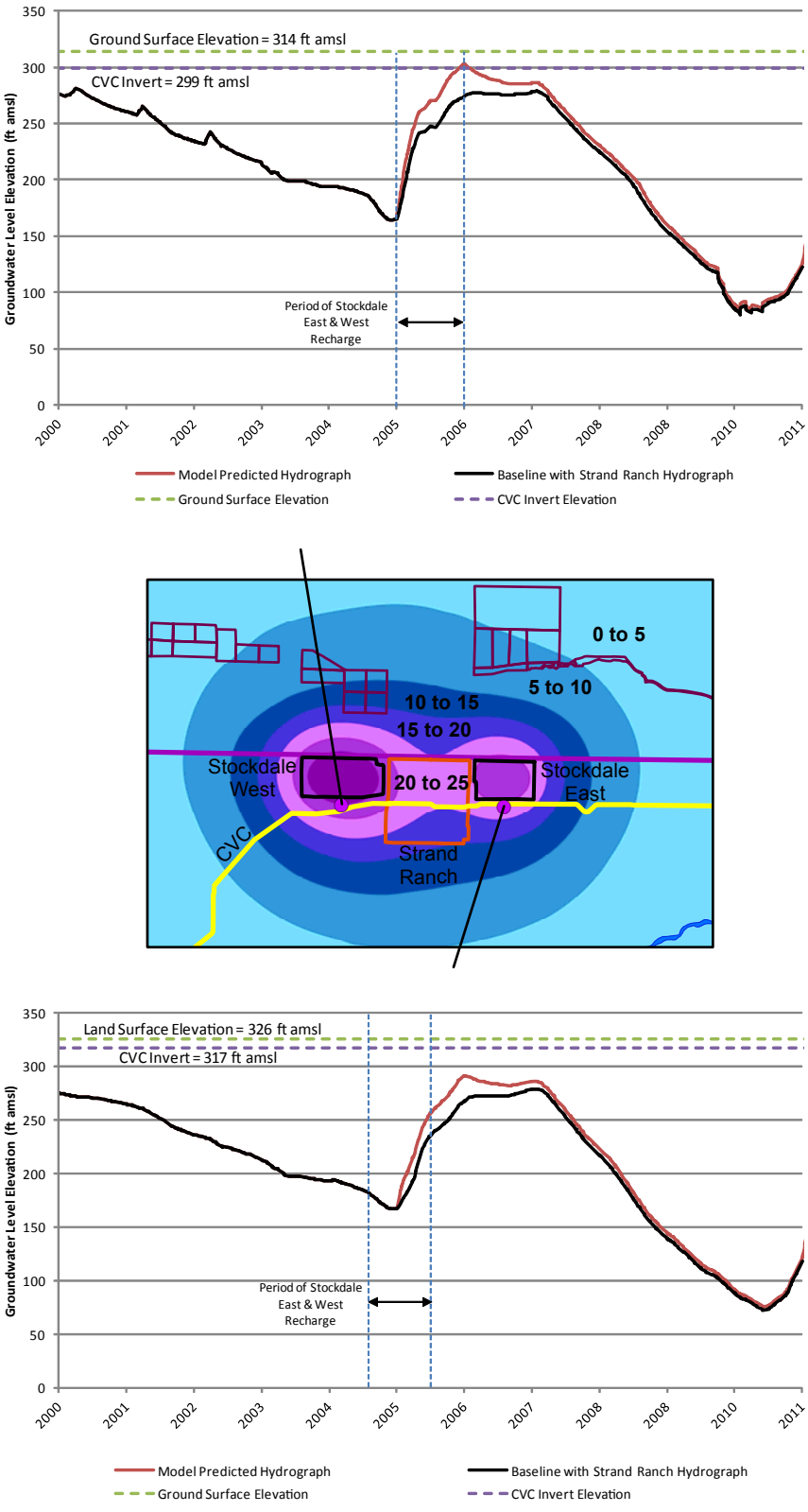
Groundwater modeling conducted for Stockdale East and Stockdale West evaluated the effects that proposed recharge would have during times of high baseline groundwater levels, simulated using conditions between January 2005 and January 2006 (THC, 2015). The Stockdale East and Stockdale West are located just to the north of the KWBA. Recharge operations may cause

groundwater levels to rise or mound beneath these sites and adjacent area. Such would be the case at the third Stockdale project site as well. Recharge modeling during a simulated period of high groundwater shows a maximum groundwater mound, relative to the hydrologic baseline, of approximately 35 feet directly beneath Stockdale West and approximately 29 feet directly beneath Stockdale East (THC, 2015). The maximum mounding would likely occur in the shallow and intermediate aquifers with lesser mounding predicted in the deep aquifer. Groundwater levels are not predicted to rise above the bottom of the CVC near Stockdale East. However, model results show that groundwater levels are predicted to rise as much as four feet above the bottom of the CVC near Stockdale West in the absence of mitigation (Figure 3.9-3). **Mitigation Measure HYDRO-2** requires development and implementation of a shallow groundwater monitoring plan prior to operation of the proposed project to avoid any impacts to the CVC.

Piezometers have been installed at Stockdale West for detecting and monitoring shallow groundwater conditions near the CVC (see Figure 2-2). The locations of the piezometers were approved by KCWA. As part of the Stockdale West Pilot Project, IRWD developed *Operating Guidelines During Shallow Groundwater Conditions* that KCWA agreed to (**Appendix F**). The Operating Guidelines allowed the Pilot Project to operate to the fullest extent possible while also protecting the CVC facilities from effects of shallow groundwater. The Operating Guidelines included four major components: piezometer installation, groundwater monitoring, evaluation of groundwater conditions, and recharge restrictions.

Mitigation Measure HYDRO-2 requires development of a similar shallow groundwater monitoring plan prior to operation of the proposed project that would be approved by KCWA. The plan would include installation of piezometers at the Stockdale Properties where necessary, groundwater monitoring requirements, identification of the critical depth at which shallow groundwater would pose a threat to the stability of CVC structures, and recharge restrictions that ensure shallow groundwater levels would not reach this critical depth. With this mitigation, impacts to subsurface structures from recharging water would be less than significant.

In addition to effects on the CVC, groundwater mounding could potentially effect recharge operations on neighboring parcels, such as the adjacent KWBA recharge basins south of Stockdale East and Stockdale West. The mounding analysis includes the effects of the proposed project together with existing KWBA operations, represented by the use of historical high water levels during periods when the Kern Water Bank was operating. The analysis shows that at the project sites and adjacent areas, groundwater levels are not anticipated to reach ground surface (Figure 3.9-3). At the KWBA recharge basins south of the CVC, project-related effects to groundwater levels would start at a maximum mounding of up to 25 feet, relative to historical high water levels, and decrease to zero feet, as the distance from the project site increases (Figure 3.9-3). The resulting effect would be no different than existing conditions under high water levels, whereby recharge rates decline over time as recharge occurs. Proposed recharge operations at Stockdale East and Stockdale West also are not expected to affect the regional direction of groundwater flow (THC, 2015). As such, impacts to operation of neighboring groundwater basins would be considered less than significant.



SOURCE: Thomas Harder & Co.

Stockdale Integrated Banking Project . 211181

Figure 3.9-3

Scenario 1: Predicted Groundwater Mounding Relative to the Cross Valley Canal Shallow/Intermediate Aquifers

Groundwater levels directly beneath Stockdale East and Stockdale West are predicted to return to pre-project conditions relatively rapidly following a period of recharge. Groundwater levels in the shallow and intermediate aquifers decline to within 10 feet of their pre-recharge levels within one year after recharge is stopped. For areas outside of the project sites, groundwater mounding would be even less. These recharge effects would be temporary and occur only as long as project recharge ponds were in operation plus the time to reach a new equilibrium once recharge operations are terminated.

Impact Determination

The proposed project could result in mounding of shallow groundwater that could affect subsurface structures, in particular the CVC. With implementation of Mitigation Measure HYDRO-2, a shallow groundwater monitoring plan would be developed and implemented that would require installation of piezometers, a monitoring program, and recharge restrictions that would ensure recharge operations do not adversely affect the CVC. As such, impacts would be less than significant with mitigation

Shallow groundwater mounding associated with proposed recharge activities would not affect the regional direction of groundwater flow. Project-related recharge would affect groundwater mounding conditions by increasing groundwater elevations between zero to 25 feet in the shallow/intermediate aquifer below neighboring recharge basins. Under conditions similar to historical high groundwater levels, such mounding effects would not result in groundwater levels reaching the ground surface and would not preclude operation of neighboring basins. The resulting effect would be no different than existing conditions under high water levels, whereby recharge rates decline over time as recharge occurs. Impacts to neighboring basins would be considered less than significant, and no mitigation is required.

Significance Conclusion

Less than Significant with Mitigation.

Mitigation Measures

HYDRO-2: Prior to operation of the project, Rosedale shall develop and implement a shallow groundwater monitoring plan for purposes of protecting subsurface structures of the Cross Valley Canal (CVC). Piezometers shall be installed adjacent to the CVC at Stockdale East and the third Stockdale project site if applicable. Piezometers have already been installed at Stockdale West. The location and design of the new piezometers shall be approved by the Kern County Water Agency (KCWA). Piezometers at the Stockdale Properties shall be used to monitor groundwater levels beneath the CVC. Prior to initiating the project, a California state licensed geotechnical engineer shall conduct an analysis to determine the critical depth at which shallow groundwater would pose a threat to the stability of CVC structures. Based on this analysis, the monitoring plan shall identify depths at which monitoring frequency shall change, such as from monthly to weekly to daily, as shallow groundwater levels approach the critical depth. The monitoring plan also shall identify the depth at which project operation would cease such that the critical depth would not be reached and the conditions

under which project operation could resume. The monitoring plan shall be approved by KCWA.

Threshold 3. Erosion

Impact HYDRO-4: The proposed project could substantially alter the existing drainage pattern of a site that could result in substantial erosion or siltation on- or off-site.

Construction

Construction of the proposed project would require excavation, grading and recontouring of soils at the project sites. During these activities, soils could be become exposed to high winds or heavy precipitation causing erosion. The proposed project would disturb more than one acre, and therefore Rosedale would be required to prepare and submit a SWPPP, which would include BMPs to minimize erosion hazards during grading and demolition activities. As part of this process, Rosedale would file a Notice of Intent with SWRCB, in compliance with the statewide NPDES General Construction Permit, and would develop and implement a SWPPP outlining the erosion control and pollution prevention measures to be used during the course of construction.

Operation

The proposed project would construct recharge basins at Stockdale East and the third Stockdale site. The basins would serve to contain storm water and thus, although the drainage pattern of the sites would be altered, would not cause substantial erosion or siltation on- or off-site. The basins also would continue to be used for agricultural purposes when not being used for recharge. Thus with the continuation of farming, grazing, or fallowing, the existing land cover would not be substantially altered from existing conditions and would not alter the conditions that affect erosion or siltation. The Central Intake Pipeline would be underground once installed and would not permanently alter the drainage pattern of the alignment.

Impact Determination

The project SWPPP would include BMPs to minimize the impacts of construction to a less than significant level. Erosion control BMPs have been proven effective at minimizing erosion during construction and associated earthwork activities. With implementation of **Mitigation Measure HYDRO-1**, the project would be able to minimize the potential for erosion or siltation to occur during construction. Once proposed facilities are installed, operation of groundwater recharge, recovery, and conveyance facilities would not alter conditions that affect erosion or siltation.

Significance Conclusion

Less than Significant with Mitigation.

Mitigation Measures

Implement **Mitigation Measure HYDRO-1.**

Threshold 6. Water Quality

Impact HYDRO-5: The proposed project could substantially degrade groundwater quality by the addition of recharge water.

As described in the setting section, the aquifer beneath the Stockdale Properties has been characterized through laboratory analysis and compared with drinking water parameters as shown in **Table 3.9-2**. The results indicate that with exception of gross alpha, the local groundwater quality meets all of the Title 22 drinking water standards. The gross alpha concentration at the Stockdale East site was found right at the MCL limit of 15 pCi/L and at the Stockdale West site slightly higher at 18.9 pCi/L.

The water quality of the surface water sources for groundwater banking is in general lower in constituent concentrations than that of the local groundwater (see Table 3.9-2). The introduction of surface water into the shallow zone will improve water quality as it has been shown to occur for the neighboring Strand Ranch project (Wildermuth, 2012a as reported in THC, 2015).

TABLE 3.9-2
WATER QUALITY FOR SELECT PARAMETERS

Analyte	Units	GW West	GW East	CA Aqueduct	Friant-Kern	Kern River	MCL
Total Dissolved Solids (TDS)	mg/l	400	280	334	41	88	500
Nitrate (NO3)	mg/l	13.4	14.4	2.4	1.4	1.0	45
Arsenic (As)	ug/l	ND	ND	7.0	2.9	5.2	10
Chloride	mg/l	81	51	NA	NA	NA	500
Gross Alpha-emission activity	pCi/L	18.9	15	NA	NA	NA	15
Uranium	pCi/L	10.2	10.9	NA	NA	NA	20

ND = Not detected above laboratory detection limit.
NA = Not available, however not known to be of concern.
GW West = Water quality of groundwater sampled at Stockdale West site.
GW East = Water quality of groundwater sampled at Stockdale East site

SOURCE: THC, 2015 and Crewdson, 2007

As described in **Chapter 3.8, Hazards and Hazardous Materials**, the transport, use, and disposal of pesticides associated with past, present and future agricultural activities would continue to be done in accordance with applicable regulatory requirements in order to protect water quality and public health. As done already at Stockdale West, construction of the recharge basins at Stockdale East and the third Stockdale project site would involve scraping/excavating surface soils to create berms, such that the recharge basin floors are below grade. Any residual pesticides in the surface soils of former agricultural areas would be scraped off the recharge basin floor. The potential for residual pesticides to be transported to the groundwater by the recharge water would be minimal since the surface soils would be scrapped from the basin floors.

Future agricultural activities at the Stockdale properties would be subject to all applicable regulatory requirements of the USEPA, CDPR, and the Kern CAC. Farming operations could include the use of restricted or unrestricted materials, including pesticides that are listed in 3 CCR Section 6800(a) and/or 6800(b). IRWD and Rosedale would require all contract farmers to comply with regulations pertaining to application of pesticides within recharge basins and in proximity to wellheads. Section 6800(a) pesticides would be restricted from application on the Stockdale Properties. Section 6800(b) pesticides could be used within the recharge basins without restriction, also in accordance with CDPR regulations. All required measures pertaining to wellhead protection also would be implemented, such as prohibiting mixing, loading, spraying, storage or pesticides within 100 feet of an unprotected wellhead, and prohibiting application of pre-emergent herbicides from the 6800(a) and 6800(b) lists between the berm and the wellhead of a protected wellhead.

Rosedale and IRWD would require the contract farmer to obtain a permit from the CAC for application of restricted materials and to comply with all conditions of the permit in order to ensure the protection of human health and the environment. The contract farmer also would be required to notify the CAC 24 hours prior to application of any restricted materials on the Stockdale Properties. The contract farmer would be required to inform Rosedale and IRWD and the CAC in the event of any accidental spill or inappropriate application of pesticides onsite. The contract farmer would be required to remediate completely and dispose of properly all contaminated soil to prevent the transport of pesticides into the groundwater and protect public health. Compliance with regulatory requirements pertaining to pesticide use would ensure impacts would be less than significant.

Also, implementation of **Mitigation Measure HAZ-1** would require that samples of soils onsite at the Stockdale East property are analyzed and appropriately remediated or removed if soils contain hazardous quantities of contaminants related to oilfield operations onsite. This would reduce any potential impacts to groundwater due to potential transport of hazardous substances during recharge activities.

Impact Determination

The surface water sources for recharge generally have constituent concentrations that are lower than the underlying groundwater, and therefore with blending, groundwater quality would likely improve. The transport, use, and disposal of pesticides would also be done in accordance with applicable regulatory requirements, including regulations specific to application of pesticides within recharge basins and in proximity to wellheads. Mitigation Measure HAZ-1 would require that samples of soils at the Stockdale East property are analyzed and removed appropriately if soils contain hazardous quantities of contaminants. Therefore impacts to water quality would be considered less than significant with mitigation.

Significance Conclusion

Less than Significant with Mitigation.

Mitigation Measures

Implement **Mitigation Measure HAZ-1** (see Chapter 3.8).

Threshold 8. 100-Year Flood Hazard Areas

Impact HYDRO-6: The proposed project could place structures within a 100-year flood hazard area.

Stockdale East, Stockdale West, the Central Intake Pipeline alignment, and the majority of the area being considered for the third Stockdale site are classified as Zone X on the Federal Emergency Management Agency's FIRM for unincorporated Kern County (FEMA, 2008), and as such, not located within a 100-year flood hazard area. However, a small area in the northwest corner of the third Stockdale site radius is classified as Zone A, indicating an area where the 100-year flood base elevations are not known (FEMA, 2008). If recharge basins were to be built in this area, introduction of a new structure could impede or redirect flood flows or alter base flood elevations on neighboring parcels.

Impact Determination

Implementation of **Mitigation Measure HYDRO-3** would ensure any development associated with the third Stockdale site would not impede or redirect flood flows, either by requiring the project design to avoid flood hazard areas or by designing the project in accordance with the Kern County Floodplain Management Ordinance to ensure flood hazards or flood elevations on neighboring parcels are not significantly altered. Impacts would be less than significant with mitigation.

Significance Conclusion

Less than Significant with Mitigation.

Mitigation Measures

HYDRO-3: If the third Stockdale project site includes a flood hazard area, then associated project facilities would be designed either: (1) to avoid development within the flood hazard area, or (2) to ensure that flood hazards or flood elevations on neighboring parcels are not significantly altered.

References – Hydrology and Water Quality

California Statewide Groundwater Elevation Monitoring (CASGEM), Department of Water Resources, 2014. Groundwater Basin Prioritization, CASGEM Basin Summary for Tulare Lake Hydrologic Region, 5/30/14. Accessed at: http://www.water.ca.gov/groundwater/casgem/prioritymap.cfm on February 24, 2015.

Department of Water Resources, *California's Groundwater Bulletin 118, San Joaquin Groundwater Basin, Kern County Subbasin*, updated January 20, 2006.

Federal Emergency Management Agency (FEMA), Federal Insurance Rate Map, Panel Nos. 6029C 1800E, 6029C 1775E, 6029C 2250E and 6029C 2275E, September 26, 2008.

High Plains Regional Climate Center, 2015. Current Climate Summary Maps – Southwest, Precipitation (in) 2/1/2014 – 1/31/2015. Accessed at: http://www.hprcc.unl.edu/maps/current/index.php?action=update_daterange&daterange=Last3m, on February 10, 2015.

Kern County Local Enforcement Agency (LEA), 2015. Personal communication with Jeffrey Marshall, Program Supervisor, Kern County LEA. February 13, 2015, 8:40 A.M.

Kern County Planning Department, 2005. Revised Update of the Kern County General Plan, Recirculated Draft Program Environmental Impact Report. Volume I, January 2004. SCH# 2002071027.

Kern County Water Agency (KCWA), Pioneer Banking Project, 2007a.

Kern County Water Agency (KCWA), Groundwater Database Records, 2007d.

Kern Fan Monitoring Committee, 2015. State Well 30S25E04J-002M, -003M, -004M, -005M, Kern County Water Agency Groundwater Database, 1990 through February 2015.

Kern Water Bank Authority (KWBA), Kern Water Bank Authority FAQ page, http://www.kwb.org/index.cfm/fuseaction/Pages.Page/id/352, accessed September 23, 2014.

Meillier, Laurent; Clark, Jordan, Loaiciga, Hugo, Hydrogeologic Study of the Kern Water Bank, University of California Santa Barbara, October 2001.

Regional Water Quality Control Board (RWQCB), 1995 revised 2004. Tulare Lake Basin water Quality Control Plan (Basin Plan), revised January 2004.

Regional Water Quality Control Board (RWQCB), 2010 Clean Water Act Section 303 (d) List of Water Quality Limited Segment, USEPA, http://www.swrcb.ca.gov/rwqcb5/water_issues/tmdl/impaired_waters_list/2008_2010_usepa_303dlist/20082010_usepa_aprvd_303dlist.pdf, USEPA approved 2010.

Thomas Harder & Co. (THC), 2015. *Draft Proposed Stockdale Integrated Banking Project – Analysis of Potential Groundwater Level Changes from Recharge and Recovery at the Stockdale West and Stockdale East Facilities*. Prepared for Rosedale-Rio Bravo Water Storage District and Irvine Ranch Water District. January 23, 2015.

Western Regional Climate Center (WRCC), Historical Climate information, http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca0439, accessed October 25, 2013.

3.10 Land Use and Planning

This chapter describes the existing land use and planning in the vicinity of the project area, the impacts to land use and planning as a result of the proposed project, and mitigation measures that would reduce significant impacts.

3.10.1 Environmental Setting

Project Vicinity

The proposed project consists of the Stockdale East property, the Stockdale West property, and a third property that would be located within a designated radius around both sites (collectively referred to as the "Stockdale Properties"). The Stockdale East property is located at the southeastern corner of Stockdale Highway and Enos Lane (Highway 43) in unincorporated Kern County. The Stockdale West property is located farther west along Stockdale Highway, adjacent to the western edge of the Strand Ranch property. Both properties are about 10 miles south of Shafter, California and six miles from the eastern boundary of Bakersfield, California. The project also consists of the Central Intake Pipeline, which would be constructed within Stockdale East and within an easement through private agricultural property between Stockdale East and Goose Lake Slough (Figure 2-4). Land use in the vicinity of the project area is dominated by agriculture and open space, but also includes groundwater recharge activities, mineral and petroleum extraction, industrial land uses, and scattered rural residences. The Kern River and floodplain, the dominant natural feature in the vicinity of the Stockdale Properties, is located approximately 2.5 miles south and east of the project sites.

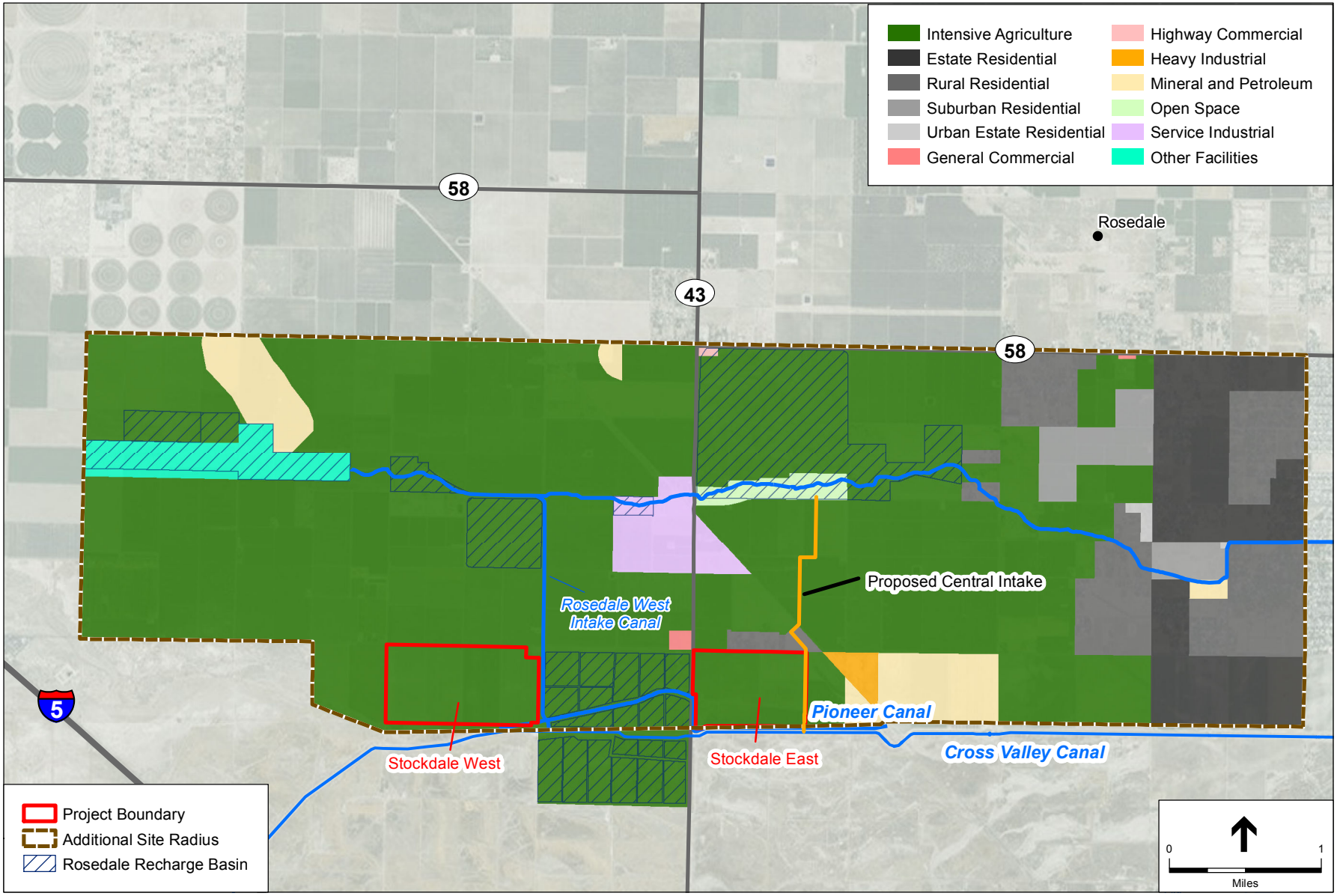
Existing Land Use Designations

Stockdale East

Stockdale East occupies approximately 230 acres within unincorporated Kern County and has been used for agricultural operations and petroleum extraction. The main crop produced on Stockdale East is alfalfa (RAM, 2009). Currently the crop grown on Stockdale East is alfalfa. Stockdale East has two onsite active oil wells with pumping units.

As shown on **Figure 3.10-1**, the Stockdale East property is designated as Intensive Agriculture (Map Code 8.1) by the County General Plan. This designation refers to areas devoted to the production of irrigated crops with a minimum parcel size of 20 acres and also includes other land uses such as groundwater recharge acres, petroleum extraction, and public utility uses (Kern County Planning Department, 2004). The Kern County Land Use designation identifies petroleum exploration and extraction as a compatible use of Intensive Agriculture (Kern County, 2004a).

The Stockdale East property is located within the planning area of the *Metropolitan Bakersfield General Plan* (Bakersfield General Plan), which is an element of the County General Plan (City of Bakersfield and Kern County, 2002). According to the Bakersfield General Plan, the land use designation at Stockdale East is Resource-Intensive Agriculture (R-IA). This designation is similar to the Intensive Agriculture designation in the County General Plan. The Intensive



SOURCE: ESRI 2013, Kern County 2013

Stockdale Integrated Banking Project . 211181

Figure 3.10-1

General Plan Land Use Designation

Agriculture designation refers to areas devoted to the production of irrigated crops with a minimum parcel size of 20 acres.

According to Zoning Map 121 of Kern County, Stockdale East is zoned as Exclusive Agriculture (A). See **Figure 3.10-2.** The purpose of the Exclusive Agriculture District is to designate areas suitable for agricultural uses and prevent encroachment by and conversion of land to non-agricultural uses. The Permitted Uses in the Exclusive Agriculture District include water storage and groundwater recharge facilities (County Zoning Ordinance, Section 19.12.020 (F)). The proposed project is exempt from County Zoning Ordinance per Government Code 53091, which states that the building and zoning ordinances "of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water…by a local agency."

The eastern portion of Stockdale East falls within the Metropolitan Bakersfield Habitat Conservation Plan (MBHCP) as shown on **Figure 3.10-3**.

Stockdale West

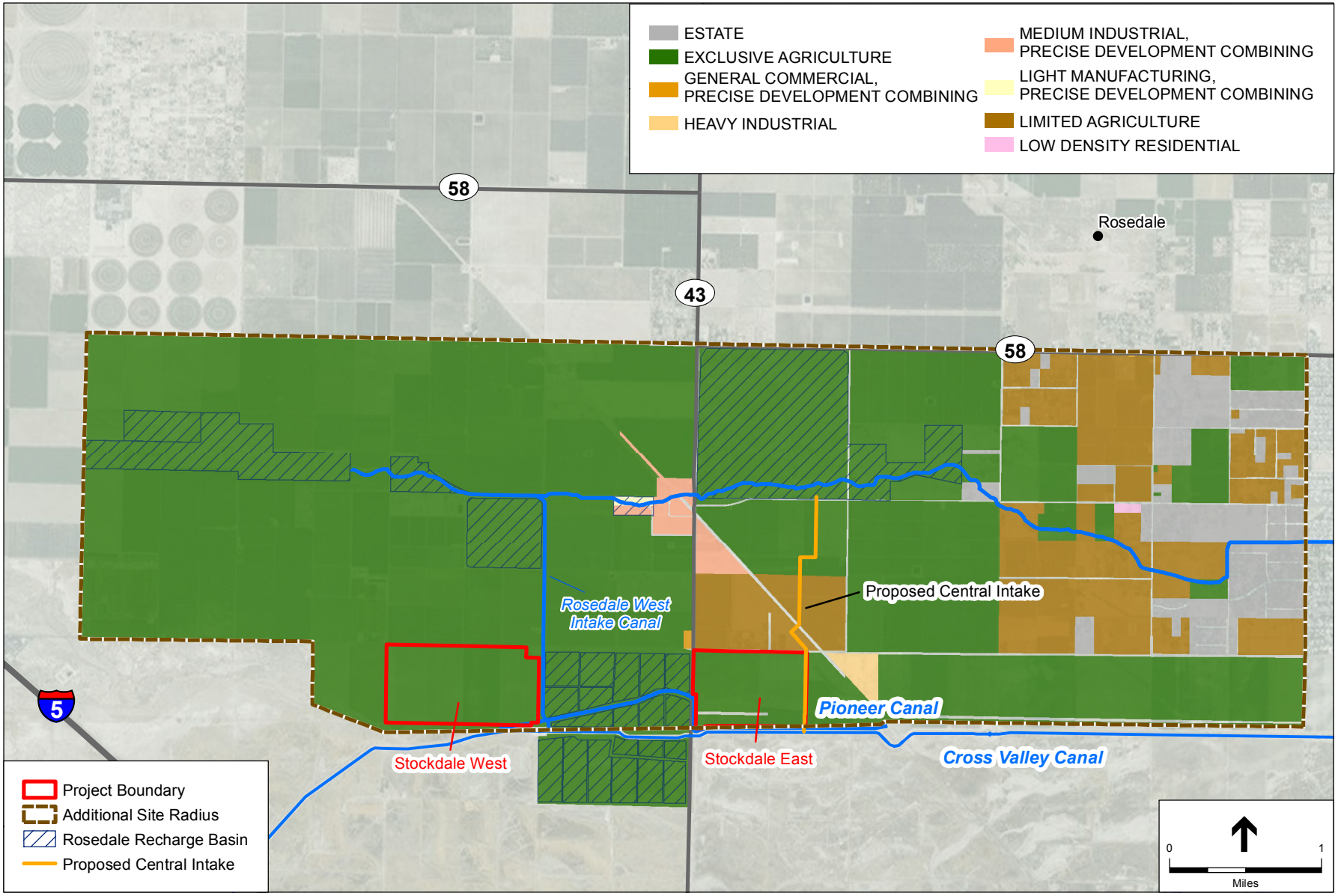
Stockdale West occupies approximately 323 acres and had been used exclusively for agriculture since the 1950's. Main crops produced on Stockdale West include vegetables and field crops. Currently, Stockdale West has been converted to four recharge basins covering 265 acres as part of the Pilot Recharge Project.

Similar to Stockdale East, the Stockdale West parcel is designated as Intensive Agriculture (Map Code 8.1) by the County General Plan (Kern County Planning Department, 2009) (Figure 3.10-1). This designation refers to areas devoted to the production of irrigated crops with a minimum parcel size of 20 acres, and also includes other land uses such as groundwater recharge acres, petroleum extraction, and public utility uses (Kern County Planning Department, 2004a).

Again, similar to Stockdale East, according to Zoning Map 121 of Kern County, Stockdale West is zoned as Exclusive Agriculture (A) (Figure 3.10-2**).** The purpose of the Exclusive Agriculture District is to designate areas suitable for agricultural uses and prevent encroachment by and conversion of land to non-agricultural uses. The Permitted Uses in the Exclusive Agriculture District include water storage and groundwater recharge facilities (County Zoning Ordinance, Section 19.12.020 (F)).The proposed project is exempt from the *Kern County Zoning Ordinance* (County Zoning Ordinance) per Government Code 53091, which states that the building and zoning ordinances "of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water…by a local agency".

Third Stockdale Site

The third Stockdale project site would be located within a site radius as shown on Figure 3.10-1, and is anticipated to be primarily agricultural land. The majority of land within the radius is designated Intensive Agriculture by the Kern County General Plan and is zoned Exclusive Agriculture, similar to Stockdale East and Stockdale West.

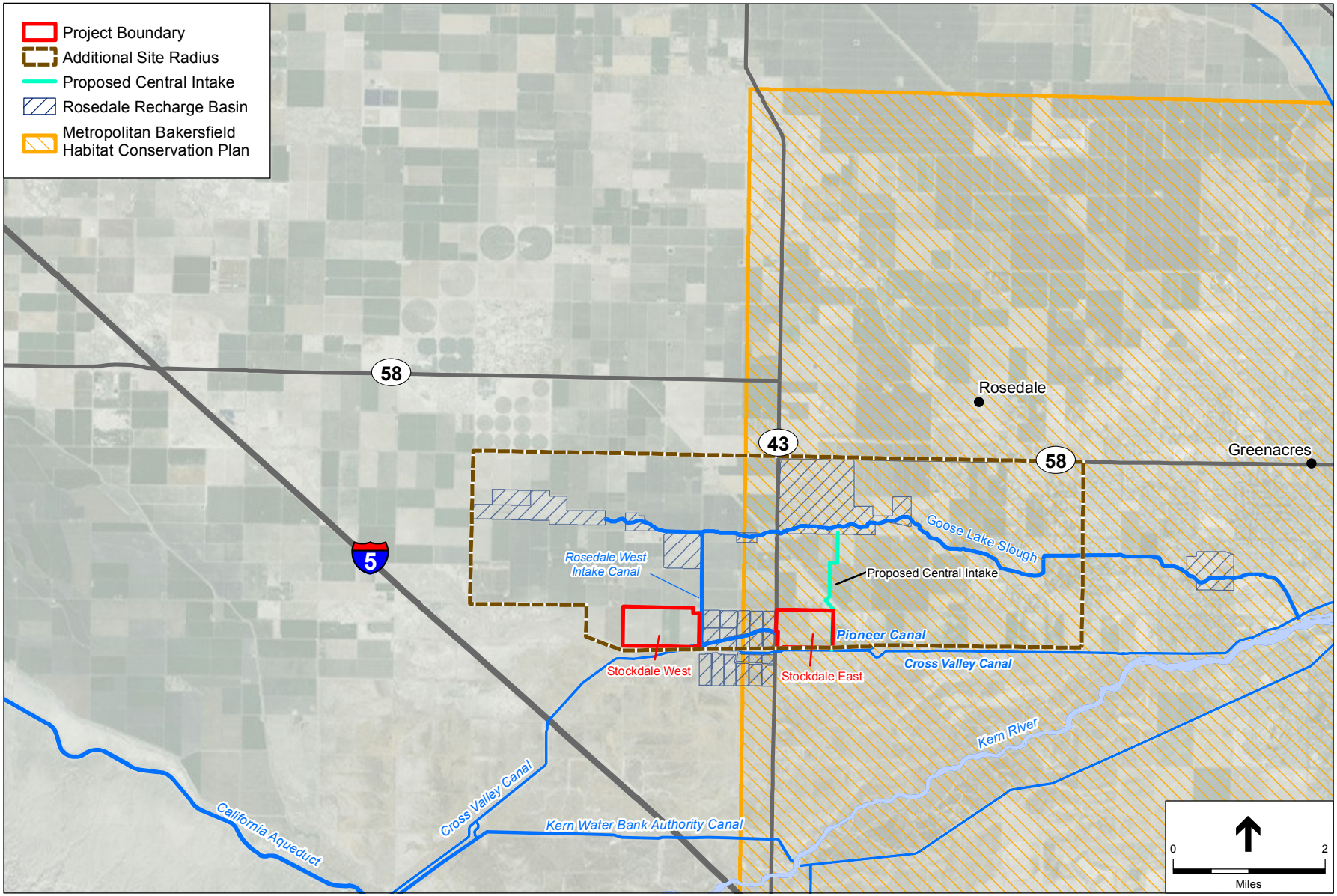


SOURCE: ESRI 2013, Kern County 2013

Stockdale Integrated Banking Project . 211181

Figure 3.10-2

Kern County Zoning Designation



SOURCE: ESRI 2013

Stockdale Integrated Banking Project . 211181

Figure 3.10-3

Habitat Conservation Planning Designation

Central Intake Pipeline

The proposed Central Intake Pipeline would run along the eastern edge of Stockdale East and then continue north. Offsite of Stockdale East, the alignment is designated as Intensive Agriculture and Rural Residential by the Kern County General Plan (Figure 3.10-1). The alignment is zoned for Exclusive Agriculture (A) and Limited Agriculture (A-1) (Figure 3.10-2). The alignment would be required to cross Stockdale Highway, the Southern Pacific Railroad, and Brimhall Road.

Surrounding Land Uses

Land surrounding the Stockdale East and Stockdale West properties is zoned by the County Zoning Ordinance as predominantly Exclusive Agricultural, Limited Agricultural, and Low-Density Residential (See Figure 3.10-2). Kern County General Plan land use designations of surrounding properties include Intensive Agriculture and Rural Residential. Actual land use in the project area is characterized by agriculture, rural residential, groundwater recharge, mineral extraction, and light industrial and commercial activity. Land within the site radius for the third Stockdale project site is overwhelmingly designated Intensive Agriculture and zoned as Exclusive Agriculture. Figure 3.10-1 illustrates the land use designations of the Stockdale Properties, Central Intake Pipeline, and surrounding area.

The properties immediately east of Stockdale East and west of Stockdale West are used for agriculture, as are properties north of both parcels. The Strand Ranch parcel is situated in the middle of both properties and currently includes recharge basins and groundwater production wells. Both properties are bordered by the Cross Valley Canal (CVC) on the south. South of the CVC, all adjacent properties are owned by Kern Bank Water Authority (KWBA) and include groundwater recharge basins. Adjacent to the northeast corner of Stockdale West is an electrical substation owned and operated by Pacific Gas & Electric (PG&E). Runoff from the substation is contained within the substation and does not intrude onto Stockdale West (Kleinfelder, 2010). The properties adjacent to the Central Intake Pipeline are used for agriculture. The Southern Pacific Railroad (SPRR) is approximately less than one-eighth mile from the northeast corner of Stockdale East and would intersect the alignment of the Central Intake Pipeline (Kern County Planning Department, 2004c). In the project vicinity, the Buttonwillow Branch of the SPRR runs west out of Bakersfield and crosses the Kern River, CVC, Stockdale Highway, and SR-58. Interstate 5 is approximately 1.5 miles south and west from Stockdale East and Stockdale West.

There are few sensitive land uses in the vicinity of the proposed project. There is a cluster of residences and a pet boarding facility on Stockdale Highway, just east of Enos Lane and north of Stockdale East. A residence is located along Superior Road approximately 0.4 miles south of Brimhall Road. There are no schools, churches, hospitals, local police or fire stations, within a two mile radius of either Stockdale East or Stockdale West. The closest school is Rio Bravo Greely School, which is approximately 3.5 miles north of the Central Intake Pipeline. The closest church is Rosedale Baptist Church, which is approximately 3 miles northeast of both properties. The closest police and emergency services is the Buttonwillow California Highway Patrol Office located at 29449 Stockdale Highway approximately 2.5 miles west of Stockdale West near Interstate 5.

Surrounding Recreational Facilities

The Kern River Parkway includes 6,000 acres of recreational facilities, including parks, trails, and waterways. The Kern River Parkway extends 30 miles from the mouth of Kern Canyon, west through the City of Bakersfield, and ends at Interstate 5. The Kern River Parkway is approximately 2.5 miles south and east of the proposed project site. Recreational activities available at Kern River Parkway include jogging, bicycling, hiking, horseback riding, canoeing and kayaking, fishing, swimming, volleyball, and other outdoor activities.

The Kern County Bicycle Facilities Plan (Kern Council of Governments, 2001) is a planning guide for the development of bicycle facilities within the county. Kern County is particularly well suited for bicycle transportation due to the warm, dry climate and flat terrain (Kern Council of Governments, 2001). The Bicycle Facilities Plan outlines existing and planned bicycle transportation routes. The Kern River Bicycle Path is part of the Kern River Parkway. This bicycle path runs along the Kern River, starting in the City of Bakersfield and ending at Enos Lane just east of Interstate 5, approximately three miles south of Stockdale East and Stockdale West (City of Bakersfield, 2007). The Kern River Bicycle Path is a Class I Bikeway, which is a right-of-way completely separated from the roadway for exclusive use of bikes and pedestrians (Kern Council of Governments, 2001).

Other than the Kern River Parkway and Bicycle Trail, the closest other recreational facilities to the proposed project sites are AW Noon Park, located in an unincorporated area seven miles southwest of the project site, the Buena Vista Aquatic Recreation Area, located seven miles south of the project site, plus eight golf courses, numerous local parks, and the Mesa Marin Raceway located in the City of Bakersfield. All of these facilities are at least five miles away from the Stockdale East and Stockdale West, and would not be located within the site radius identified for the third Stockdale project site.

3.10.2 Regulatory Setting

Local

Kern County General Plan

Land use in the vicinity of the proposed project is governed by the Land Use, Open Space, and Conservation Element of the County General Plan (Kern County Planning Department, 2004a). The following goals, policies, and implementation measure are applicable to the proposed project:

> **Goal 1:** Kern County residents and businesses should receive adequate and cost effective public services and facilities. The County will compare new urban development proposals and land use changes to the required public services and facilities needed for the proposed project.
>
> **Goal 5:** Ensure that adequate supplies of quality (appropriate for intended use) water are available to residential, industrial, and agricultural users within Kern County.
>
> **Policy 35:** Ensure that adequate water storage, treatment, and transmission facilities are constructed concurrently with planned growth.

Policy 39: Encourage the development of the County's groundwater supply to sustain and ensure water quality and quantity for existing users, planned growth, and maintenance of the natural environment.

Implementation Measure X: Encourage effective groundwater resource management for the long-term benefit of the County through the following:

- Promote groundwater recharge activities in various zone districts.
- Support the development of future sources of additional surface water and groundwater, including conjunctive use, recycled water, conservation, additional storage of surface water, and groundwater and desalination.

Kern County Zoning Ordinance

The land use categories set forth in the County General Plan are implemented through the County Zoning Ordinance. Stockdale East and Stockdale West are currently zoned as Exclusive Agriculture (A), and the Central Intake is currently zoned as Exclusive Agriculture (A) and Limited Agriculture (A-1). According to Sections 19.12.020 and Section 19.14.020 of the County Zoning Ordinance, permitted uses for the Exclusive Agriculture and Limited Agriculture designations include water storage or groundwater recharge facilities. The proposed project is exempt from the County Zoning Ordinance per Government Code 53091, which states that the building and zoning ordinances "of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water…by a local agency."

Metropolitan Bakersfield General Plan

The project site is within the planning area of the Metropolitan Bakersfield General Plan (City of Bakersfield and Kern County, 2002). The Land Use Element of the Bakersfield General Plan includes one goal and one implementation measure that are applicable to the proposed project:

Goal 3: Accommodate new development which is compatible with and complements existing land use.

Implementation Measure 7: Local guidelines for project processing shall reflect *CEQA Guidelines* which state that the environmental effects of a project must be taken into account as part of the project consideration.

Metropolitan Bakersfield Habitat Conservation Plan

Stockdale West is located within the planning area covered by the MBHCP. The MBHCP is a program that addresses the effect of urban growth on federally and state protected plant and animal species within the Metropolitan Bakersfield General Plan area. The MBHCP is a joint program of the City of Bakersfield and Kern County that was undertaken to assist urban development applicants in complying with state and federal endangered species laws.

The MBHCP utilizes a mitigation fee paid by applicants for grading or building permits to fund the purchase and maintenance of habitat land to compensate for the effects of urban development on endangered species habitat. The lands to be acquired for the program are generally located outside the Metropolitan Bakersfield area.

Kern County and the City of Bakersfield have entered into a legal agreement with the California Department of Fish and Game and the U.S. Fish and Wildlife Service that spells out obligations in conjunction with the MBHCP. The agreement allows the County and the City to receive habitat mitigation credit that can be applied against future habitat loss that accompanies urban development.

3.10.3 Impact Assessment

Thresholds of Significance

The following criteria from Appendix G of the *CEQA Guidelines* are used as thresholds of significance to determine the impacts of the proposed project as related to land use and planning. The proposed project would have a significant impact if it would:

1. Physically divide an established community.
2. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.
3. Conflict with any applicable habitat conservation plan or natural community conservation plan.

Effects Found Not to be Significant

Threshold 1. Divide an Established Community

Stockdale East, Stockdale West, and the Central Intake Pipeline are located in an agricultural and rural residential community. Construction and operation of recharge basins, production wells, and conveyance structures on these properties would be consistent with existing community land use and would not serve to divide an established community. Similarly, the third Stockdale project site also would be located within agricultural and rural residential communities as defined by the site radius. Development of recharge basins and production wells within this radius also would not divide the established community. No impact would occur.

Impacts and Mitigation Measures

Threshold 2. Land Use Plan, Policy, and Regulation

Impact LU-1: The proposed project could conflict with any applicable land use plan, policy, or regulation of the jurisdiction over the project.

Stockdale East and Stockdale West

The Kern County and Metropolitan Bakersfield General Plans designate the land use at Stockdale East and Stockdale West as Intensive Agriculture. The Intensive Agriculture designation allows groundwater recharge facilities, and petroleum exploration and extraction, as compatible land uses. Both parcels are zoned for Exclusive Agriculture. The County Zoning Ordinance allows groundwater recharge facilities in Exclusive Agriculture Districts. The proposed project does not require a conditional use permit. The proposed project is compatible with applicable land use plans, policies, and regulations.

The Stockdale East and Stockdale West properties are divided into quadrants by mid-section lines, and are surrounded by section lines as designated by Kern County. Mid-section lines are reserved by the County for arterial roadways and require a setback between 45 feet to 70 feet while section lines require a setback of 55 to 90 feet (Kern County Planning Department, 2012). Mid-section lines on the Stockdale West property have been preserved with dirt road levee tops approximately 20 feet wide. Mid-section lines on the other Stockdale Properties would be similarly preserved through design and location of basins and wells that avoid mid-section lines.

Although not required, if the mid-section lines were eliminated through an amendment to the Kern County General Plan, then the proposed project facilities would not have to be designed to accommodate the setbacks. With implementation of optional **Mitigation Measure LU-1**, the mid-section lines would be eliminated.

Third Stockdale Site

The location of the third Stockdale project site has not yet been determined. Land within the site radius shown on Figure 3.10-1 is primarily Intensive Agriculture, similar to both the Stockdale East and Stockdale West properties. As shown on Figure 3.10-2., land within the site radius is zoned primarily Exclusive Agriculture. It is anticipated that the third Stockdale project site would be located on agricultural land designated as Intensive Agriculture by the Kern County General Plan, which allows for groundwater recharge facilities. Kern County Setback and mid-section line requirements would be adhered to, similar to Stockdale East and Stockdale West.

Central Intake Pipeline

The Central Intake Pipeline is designated as Intensive Agriculture and Rural Residential by the Kern County General Plan (Figure 3.10-1). The Intensive Agriculture designation allows groundwater recharge facilities including conveyance structures. The alignment is zoned for Exclusive Agriculture and Limited Agriculture (Figure 3.10-2). The County Zoning Ordinance allows groundwater recharge facilities in Exclusive Agriculture and Limited Districts. The proposed project is compatible with applicable land use plans, policies, and regulations.

The Central Intake Pipeline would cross under Stockdale Highway and the Southern Pacific Railroad; jack-and-bore or other tunneling construction techniques would be employed to avoid disruption of these surface features. In these locations the proposed project would be required to secure encroachment and right of way permits from Kern County, Southern Pacific Railroad, and any other agency with jurisdiction over the crossings. Additionally, the alignment would be required to secure a temporary encroachment and right of way permit for trenching activity across

Brimhall Road, which would be secured from the County and all applicable agencies prior to construction. The southern portion of the Central Intake would be constructed within Stockdale East and no permanent easement would be required. The portion of the alignment north of Stockdale East would be constructed through private property, and a permanent easement would be required prior to construction. In addition, both the Stockdale West Turnout and the Central Intake Turnout would require approval from KCWA for modifications to the CVC and approval from KWBA to allow the pipelines leading from the turnouts to cross under the Pioneer Canal.

Impact Determination

The proposed project would be compatible with applicable land use plans, policies and regulations of Kern County. Applicable permits, approvals, and easements would need to be secured prior to construction of the Central Intake Pipeline and Turnout and the Stockdale West Turnout. Design of project facilities would be required to accommodate setbacks from mid-section lines, or implementation of optional Mitigation Measure LU-1 would eliminate mid-section lines and any associated setback requirements. Impacts to land use would be considered less than significant, since Mitigation Measure LU-1 is not required.

Significance Conclusion

Less than Significant.

Mitigation Measure

LU-1: A General Plan Amendment may be requested from Kern County to eliminate the mid-section line setback requirements from the Stockdale properties.

Threshold 3. Habitat Conservation Plan

Impact LU-3: The proposed project could conflict with the Metropolitan Bakersfield Habitat Conservation Plan.

The Stockdale East property and the Central Intake alignment fall within the boundaries of the MBHCP area. The third Stockdale project site has not yet been determined, and could fall within the jurisdiction of the MBHCP as shown on Figure 3.10-3. The MBHCP's primary focus is on lands converted to urban uses (MBHCP, 1994). The MBHCP sets forth a program for the preservation and protection of habitat for several rare or endangered species found in the HCP study area in exchange for the loss of some existing habitat from urban development. The MBHCP permit only applies to City or County actions or actions by others, which involve City or County permits. Special agencies, such as Rosedale, that are exempt from local permitting have other options with regard to endangered species issues, including resolving endangered species issues directly with USFWS and CDFW (MBHCP, 1994).

Impact Determination

Given that the proposed project would not result in the conversion of land to urban uses, and that mitigation measures have been included to reduce project impacts to threatened and endangered

species to less than significant levels (see Mitigation Measures BIO-1 though BIO-10 in Chapter 3.4 Biological Resources), the proposed project would not conflict with the MBHCP. Impacts would be less than significant, and no additional mitigation is required.

Significance Conclusion

Less than Significant.

Mitigation Measures

None required.

References – Land Use and Planning

City of Bakersfield and Kern County, 2002. *Metropolitan Bakersfield General Plan Update EIR,* adopted June 26, 2002.

City of Bakersfield and Kern County, 1994. *Metropolitan Bakersfield Habitat Conservation Plan.* April 1994.

City of Bakersfield, Kern River Parkway & Bakersfield's Bicycle Trails, www.bakersfieldcity.us/recreation/Kern_River_Parkway.htm, accessed October 11, 2013.

Kern County Planning Department, 2004. *Kern County General Plan Update EIR,* adopted June 15, 2004. *Kern County Bicycle Facilities Plan*

Kern County, 2012. *Kern County Agricultural Preserve Map*. Kern County Online Mapping System. 2012.

Kern Council of Governments, 2001. Kern County Bicycle Facilities Plan. Adopted October 2001.

RAM, 2009. *Phase I Environmental Site Assessment for the Rosedale Rio-Bravo Storage District*. January 2010.

3.11 Mineral Resources

This chapter describes the affected environment and regulatory setting for mineral resources. It also describes the impacts on mineral resources that would result from implementation of the proposed project, and mitigation measures that would reduce these impacts, if applicable. The information in this chapter is based on available literature and research.

3.11.1 Environmental Setting

Kern County is one of the richest oil-producing counties in the United States in which approximately 2,971 square miles of land in Kern County are classified as Mineral Resource Zones (MRZs) of varying significance. The valley floor area of Kern County and the surrounding lower elevations of the mountain ranges contain numerous deposits of oil and gas resources, a major economic resource for the County. Mineral resources in Kern County include numerous mining operations that extract a variety of materials, including sand and gravel, stone, gold, dimensional stone, limestone, clay, shale, gypsum, pumice, decorative rock, silica, and specialty sand. MRZs have been designated to indicate the significance of mineral deposits. The MRZ categories are as follows:

MRZ-1: Areas where adequate information indicates that no significant mineral deposits are present or where it is judged that little likelihood exists for their presence.

MRZ-2: Areas where adequate information indicates significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence.

MRZ-3: Areas containing mineral deposits the significance of which cannot be evaluated from available data.

MRZ-4: Areas where available information is inadequate for assignment to any other MRZ.

According to the *Mines and Mineral Resources of Kern County, California*, there are no MRZs within the vicinity of the project site (USGS, 1962). Kern County has been a major oil producer since the early 1900s. Stockdale East, Stockdale West, and the Central Intake are located within the Strand Oil Field (DOGGR, 2013a). A portion of the site radius for the third Stockdale site also is included in the boundaries of the Strand Oil Field. Other oil fields exist in the vicinity of this potential third site as well. Mineral rights associated with and underlying the Stockdale East, Stockdale West, and Central Intake alignment are not owned by Rosedale or IRWD. The same would be true for the third property to be acquired. Both Rosedale and IRWD would be required to design surface facilities to allow for mineral rights owners to access subsurface oil resources in the future.

Sand and Gravel

Sand and gravel have been determined to be important resources for construction, development, and physical maintenance, from highways and bridges to swimming pools and playgrounds. The availability of sand and gravel affects construction costs, tax rates, and affordability of housing

and commodities. The State of California has statutorily required the protection of sand and gravel operations. Because transportation costs are a significant portion of the cost of sand and gravel, the long-term availability of local sources of this resource is an important factor in maintaining the economic attractiveness of a community to residents, business, and industry. The major resources of sand and gravel in Kern County are in stream deposits along the eastern side of the San Joaquin Valley and in the Sierra Nevada foothills, and in alluvial fan deposits along the north flank of the San Emidio and Tehachapi Mountains at the southern end of the County. Most of the recent alluvium in the San Joaquin Valley floor is composed of sand used as a source of road base material.

3.11.2 Regulatory Setting

State

Division of Oil, Gas, and Geothermal Resources (DOGGR)

Division of Oil, Gas and Geothermal Resources (DOGGR) is a state agency responsible for supervising the drilling, operation, maintenance, plugging, and abandonment of oil, gas, and geothermal wells. DOGGR's regulatory program promotes the sensitive development of oil, natural gas, and geothermal resources in California through sound engineering practices, prevention of pollution, and implementation of public safety programs. To implement this regulatory program, DOGGR requires avoidance of building over or near plugged or abandoned oil and gas wells, or requires the remediation of wells to current DOGGR standards.

Surface Mining and Reclamation Act of 1975

The Surface Mining and Reclamation Act of 1975 State requires the State Geologist to classify land into MRZs according to its known or inferred mineral potential. The primary goal of mineral land classification is to ensure that the mineral potential of land is recognized by local government decision-makers and considered before land-use decisions are made that could preclude mining.

Local

Kern County General Plan

The Land Use, Open Space and Conservation Element of the Kern County General Plan provides goals, policies, and implementation measures that relate to the protection of important mineral, petroleum, and agricultural resources and ensures that development of resource areas minimize effects to neighboring resource lands. The General Plan also provides policies that emphasize conservation of identified mineral deposits, and protection of lands classified as MRZ-2. The goal, policies, and implementation measures applicable to the proposed project regarding mineral resources include:

Land Use, Conservation, and Open Space Element, Resource Section

Goal 2: Protect areas of important mineral, petroleum, and agricultural resource potential for future use.

Policy 14: Emphasize conservation and development of identified mineral deposits.

Implementation Measure H: Use the California Geological Survey's latest maps to locate mineral deposits until the regional and statewide importance mineral deposits map has been completed, as required by the Surface Mining and Reclamation Act.

3.11.3 Impact Assessment

Thresholds of Significance

The following criteria from Appendix G of the *CEQA Guidelines* are used as thresholds of significance to determine the impacts of the proposed project as related to mineral resources. The proposed project would have a significant impact if it would:

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.
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.

Effects Found Not to be Significant

Threshold 2. Locally-Important Mineral Resource

The proposed project would not result in the loss of locally important mineral resources. The project sites are not located within a designated MRZ. The proposed project would not result in the loss of availability of locally valuable sand and gravel resources. There would be no impact.

Impacts and Mitigation Measures

Threshold 1. Loss of Availability of Regionally-Important Mineral Resources

Impact MRS-1: The proposed project could block access to oil resources beneath the Stockdale Properties.

The Stockdale West property is currently developed with groundwater recharge basins and earthen berms. No important mineral resources, including oil resources have been identified onsite. The Stockdale East property is currently cultivated for agricultural use and contains an active oilfield, including oil pads and drums associated with oilfield activities. The Central Intake alignment north of Stockdale East would be located in the vicinity of one active oil and gas well. The oilfields and wells may remain active during project implementation and operation. Rosedale would be required to accommodate existing and future drill islands to maintain access to

underlying mineral rights. With incorporation of the drill islands into the project design, the proposed project would not impede future access to subsurface mineral resources.

In addition, the operation of groundwater banking facilities at Stockdale East would not be expected to affect active or abandoned oil wells. Well construction records for the nine known wells on Stockdale East indicate that all are constructed with an upper casing and outer cement seal that extend to a minimum of 495 ft bgs (THC, 2014). Historical groundwater fluctuations have occurred in the upper approximate 290 ft bgs, which is well above the bottom of the shallowest oil well upper seal depth (THC, 2015). Project pumping is expected to add a maximum of approximately 24 ft of drawdown directly below Stockdale East (see Chapter 3.9, Hydrology and Water Quality), which would not cause groundwater levels to reach 495 ft bgs. Therefore, the operation of recharge and recovery facilities at Stockdale East would not be expected to significantly change the existing hydraulic connection of the oil wells with the aquifer system. Impacts to oil wells are considered less than significant.

The third Stockdale project site has not yet been determined but would be located within a designated site radius that is zoned primarily for agricultural uses. There are active oil fields located within and around the site radius, including the Strand Oil Field. During the selection of the third Stockdale project site, further analysis of potential active or future oilfield activities would be conducted. Incorporation of well pad areas into future design of facilities on the third Stockdale project site and avoiding areas designated for future drill islands would ensure future access to any subsurface mineral resources is not impacted.

Impact Determination

Development of groundwater banking facilities on the Stockdale properties would not preclude existing or future access to any underlying mineral rights, such as oil rights. Where necessary, the design of recharge basins, wells, and conveyance structures would be required to avoid existing and future drill islands, when the project site is located over an oil field. The proposed project would not result in the loss of availability of regionally-important mineral resources. The proposed project also would not have adverse direct effects to the existing oil wells within Stockdale East. Impacts would be less than significant.

Significance Conclusion

Less than Significant.

Mitigation Measures

None required.

References – Mineral Resources

California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR), 2013. *DOGGR Online Mapping System.* Accessed at: http://maps.conservation.ca.gov/doms/doms-app.html?api=01120486

California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR), 2013a. *Kern County Oil Fields.* Accessed at: ftp://ftp.consrv.ca.gov/pub/oil/maps/dist4/Dist4_fields.pdf.

City of Bakersfield and Kern County, 2007. *Metropolitan Bakersfield General Plan.*

Kern County Planning Department, 2004. *Kern County General Plan Update EIR.*

Kern County Planning Department, 2009. *Kern County General Plan Land Use, Open Space and Conservation Elements.*

Thomas Harder & Co., 2014. *Draft Technical Memorandum – Stockdale Integrated Banking Project – Potential Impacts of Groundwater Level Changes on Abandoned Oil Wells.* Prepared for Rosedale-Rio Bravo Water Storage District. April 11, 2014.

Thomas Harder & Co., 2015. *Draft Proposed Stockdale Integrated Banking Project – Analysis of Potential Groundwater Level Changes from Recharge and Recovery at the Stockdale West and Stockdale East Facilities*. Prepared for Rosedale-Rio Bravo Water Storage District and Irvine Ranch Water District. January 23, 2015.

U.S. Geological Survey, 1969. *Mines and Mineral Resources of Kern County, California*.

3.12 Noise

This chapter presents information on ambient noise and vibration conditions in the vicinity of the proposed project and identifies potential impacts associated with noise and vibration due to construction and operation of the proposed project.

3.12.1 Environmental Setting

Sound and Noise

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Noise can be defined as unwanted sound. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level. The decibel (dB) scale is used to quantify sound intensity. Since the human ear is not equally sensitive to all frequencies within the entire spectrum, noise measurements are weighted more heavily within those frequencies of maximum human sensitivity in a process called "A-weighting," referred to as dBA. With regard to increases in A-weighted noise levels, it is widely accepted that the average person can barely perceive noise level changes of 3 dBA, while a change in noise levels of 5 dBA is a readily perceptible increase in noise levels and the minimum required increase for a change in community reaction (Caltrans, 1998). An increase of 10 dBA is perceived as a doubling of loudness.

Time variation in noise exposure is typically expressed in terms of the average energy over time (L_{eq}), or alternatively, as a statistical description of the sound level that is exceeded over some fraction of a given period of time. For example, the L50 noise level represents the noise level that is exceeded 50 percent of the time. Half the time the noise level exceeds this level and half the time the noise level is less than this level. This level is also representative of the level that is exceeded 30 minutes in an hour. Several methods have been devised to relate noise exposure over time to human response. The Day-Night Noise Level (DNL) is a 24-hour L_{eq} that adds a 10 dBA penalty to sounds occurring between 10:00 p.m. to 7:00 a.m. to account for the increased sensitivity to noise events that occur during the quiet late evening and nighttime periods. A commonly used noise metric for this type of study is the Community Noise Equivalent Level (CNEL). The CNEL adds a 5 dBA penalty to noise occurring during evening hours from 7:00 p.m. to 10:00 p.m., and a 10 dBA penalty to sounds occurring between the hours of 10:00 p.m. to 7:00 a.m. to account for the increased sensitivity to noise events that occur during the quiet late evening and nighttime periods. Thus, the CNEL noise metric provides a 24-hour average of A-weighted noise levels at a particular location, with an evening and a nighttime adjustment, which reflects increased sensitivity to noise during these times of the day. The DNL and the CNEL are similar noise descriptors in most urban dominated environments. These descriptors are best used for measuring average increases in overall noise over a daily period and not single event noises, which are best described as unique events.

Vibration

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (Vdb) is commonly used to measure RMS. The decibel notation acts to compress the range of numbers required to describe vibration (FTA, 1995). Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration.

Existing Ambient Noise and Vibration Environment

Noise

The proposed project would be located in a rural, agricultural area. Noise sources in rural areas are typically natural, including insects, birds, wind, and weather. Accordingly, existing ambient noise levels in rural areas such as the project sites are low. Background noise levels in rural areas typically range between 35 and 45 dBA DNL. The primary sources of noise in the rural agricultural areas are roadway traffic and farm machinery on a seasonal basis. Background noise levels are approximately 40 dBA in rural residential areas and 45 dBA in agricultural cropland with equipment operating (FERC 2002, USEPA 1978).

Vibration

Similar to the environmental setting for noise, the vibration environment is dominated by traffic from nearby roadways. Heavy trucks can generate ground-borne vibrations that vary depending on vehicle type, weight, and pavement conditions. As heavy trucks typically operate on major streets, existing ground-borne vibration in the project vicinity is largely related to heavy truck traffic on the surrounding roadway network. Vibration levels from adjacent roadways are generally not perceptible in the project area.

Sensitive Receptors

Noise

Land uses deemed sensitive by the State of California include schools, hospitals, rest homes, and long-term care and mental care facilities, which are considered to be more sensitive to ambient noise levels than others. Many jurisdictions also consider residential uses particularly noise-sensitive because families and individuals expect to use time in the home for rest and relaxation, and noise can interfere with those activities. Some jurisdictions may also identify other noise-sensitive uses such as churches, libraries, and parks. Land uses that are generally not considered to be noise sensitive receptors include office, commercial, and retail developments.

Consequently, the noise standards for sensitive land uses are more stringent than for those at less sensitive uses. The Kern County Noise Element has identified the following land uses as sensitive receptors: residential areas, schools, convalescent and acute care hospitals, parks and recreational areas, and churches (Kern County Planning Department, 2010).

The proposed project site is located in a rural area characterized by agriculture uses and including scattered single-family, ranch-style residences. There are few sensitive land uses in the vicinity of the proposed project. The nearest residences are across Stockdale Highway, approximately 800 feet north of the edge of Stockdale West, 200 feet north of Stockdale East, and 300 feet west of the Central Intake alignment near the railroad crossing. There are no schools, churches, hospitals, local police or fire stations, within a two mile radius of the Stockdale West and East properties. The closest school is Rio Bravo Greeley School, which is approximately 3.5 miles north of the Central Intake. The closest church is Rosedale Baptist Church, which is approximately three miles northeast of the Stockdale West and Stockdale East properties. The additional site radius for the third Stockdale project site includes residential uses on the eastern boundary. The Rio Bravo Greeley School is located just north of the site radius boundary.

Vibration

Sensitive receptors for vibration include structures (especially older masonry structures), people (especially residents, the elderly and sick), and vibration sensitive equipment. Sensitive vibration receptors for the proposed project are the same as the noise sensitive receptors presented above.

3.12.2 Regulatory Setting

Federal, State, and local agencies regulate different aspects of environmental noise and vibration. Federal and State agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is left to local agencies. 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; local noise ordinances establish standards and procedures for addressing specific noise sources and activities. Kern County has developed general plan policies, goals, and guidelines regarding the ambient noise environment, which would be applicable to the proposed project, as discussed below.

Federal

Federal Noise Policies

There are no Federal noise standards that directly regulate environmental noise related to construction or operation of the proposed project. With regard to noise exposure and the workplace, the Office of Environmental Health and Safety regulations safeguard the hearing of workers exposed to occupational noise.

Federal Vibration Policies

The Federal Railway Administration (FRA) and the Federal Transit Administration (FTA) have published guidance relative to vibration impacts. According to the FRA, fragile buildings can be exposed to ground-borne vibration levels of 0.5 PPV without experiencing structural damage (FRA, 1998). The FTA has identified the human annoyance response to vibration levels as 80 RMS (FTA, 1995).

State

There are no State noise standards that directly regulate environmental noise related to construction or operation of the proposed project. The State has promulgated the California Noise Insulation Standards, found in *California Code of Regulations*, Title 24 (known as the Building Standards Administrative Code), Part 2 (known as the California Building Code), Appendix Chapters 12 and 12A. These standards set forth an interior standard of DNL 45 dBA for habitable spaces. These standards may be applied to residences located near construction activity or stationary noise sources as a method of examining potentially intrusive noise.

State Vibration Policies

There are no adopted State policies or standards for ground-borne vibration. Caltrans does recommend that extreme care be taken when sustained pile driving occurs within 7.5 meters (25 feet) of any building, and 15 to 30 meters (50 to 100 feet) of a historic building or a building in poor condition.

Local

Kern County General Plan: Noise Element

County policies for noise are included in the Noise Element of the Kern County General Plan (Kern County Planning Department, 2010). The purpose of the Noise Element is to: (1) establish reasonable standards for maximum desired noise levels in Kern County, and; (2) develop an implementation program which could effectively deal with the noise problem. The County noise goals, policies, and standards are based on standards suggested by the U.S. Environmental Protection Agency (EPA) and the California Department of Health. The Noise Element requires that proposed commercial and industrial uses or operations be designed or arranged so they would not subject residential or other noise sensitive land uses to exterior noise levels in excess of 65 dBA DNL or less in outdoor activity areas and interior noise levels in excess of 45 dBA DNL.

Kern County Noise Ordinance

Chapter 8.36 of the Kern County Code addresses noise issues. These include acceptable hours of construction and limitations on construction related noise impacts on adjacent sensitive receptors. Noise producing construction activities that are audible to a person with average hearing ability at a distance of 150 feet from the construction site, or within 1,000 feet of an occupied residential dwelling are prohibited between the hours of 9:00 p.m. to 6:00 a.m. on weekdays, and 9:00 p.m. to 8:00 a.m. on weekends. However the following exceptions are permitted:

1. The resource management director or his designated representative may for good cause exempt some construction work for a limited time.
2. Emergency work is exempt from this section.

3.12.3 Impact Assessment

Thresholds of Significance

The following criteria from Appendix G of the *CEQA Guidelines* are used as thresholds of significance to determine the impacts of the proposed project as related to noise and vibration. The proposed project would have a significant impact if it would:

1. Result in 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.
2. Result in exposure of persons to, or generation of, excessive groundborne vibration or groundborne noise levels.
3. Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project
4. Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project
5. For a project located within an airport land use plan area, or, where such a plan has not been adopted, in an area within two miles of a public airport or public use airport, would the project expose people residing or working in the area to excessive noise levels
6. For a project located in the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels.

Effects Found Not to be Significant

Threshold 5. Airport Land Use Plan

The proposed project is not located within two miles of public airport or public use airport or located within an airport land use plan area. The nearest airport to the project site is a private model airplane airfield, located adjacent to the northernmost portion of the Central Intake north of Brimhall Road. The airfield is approximately 650 feet in length. The nearest public commercial airport is Meadows Field Airport, approximately 20 miles northeast of the Stockdale East and West properties and approximately eight miles northeast of the eastern boundary of the additional site radius. Therefore, the proposed project would not expose people residing or working in the area to excessive noise levels.

Threshold 6. Private Airstrip

A private model airplane airfield is located adjacent to the northernmost portion of the Central Intake north of Brimhall Road and approximately one mile north of Stockdale East. The airstrip is approximately 650 feet in length and includes a small open shaded area. There are no residences or buildings where people live or work associated with the airstrip that would be exposed to excessive noise levels as a result of construction of the Central Intake or facilities on Stockdale

East and Stockdale West. Therefore, the proposed project would not expose people residing or working in the area to excessive noise levels.

Impacts and Mitigation Measures

Threshold 1. Noise Level Standards

Impact NOISE-1: The proposed project could generate noise levels that exceed noise standards.

The proposed project would involve temporary noise sources associated with general construction activity. Construction of the proposed facilities on Stockdale East, Stockdale West, and the Central Intake is anticipated to begin in summer 2015 and continue in approximately six-month phases, with a total of four to six sequential phases. Construction of facilities on the third Stockdale project site would follow similar phasing but would occur at a later date, subsequent to Stockdale East and Stockdale West. Noise impacts from construction activities would be a function of the noise generated by construction equipment, the equipment location, and the timing and duration of the noise-generating activities. Construction would involve site clearing; demolition; excavation and backfill; construction of basins, conveyances, and recovery facilities; and site restoration. Each stage would involve the use of different kinds of construction equipment and, therefore, has its own distinct noise characteristics. As such, construction activity noise levels at and near the project site would fluctuate depending on the particular type, number, and duration of uses of construction equipment. Construction-related material haul trips would raise ambient noise levels along haul routes, depending on the number of haul trips made and types of vehicles used. **Table 3.12-1** shows typical exterior noise levels at various phases of commercial construction, and **Table 3.12-2** shows typical noise levels associated with various types of equipment.

TABLE 3.12-1
TYPICAL CONSTRUCTION NOISE LEVELS

Construction Phase	Noise Level (dBA, Leq)[a]
Ground Clearing	84
Excavation	89
Foundations	78
Erection	85
Finishing	89

[a] Average noise levels correspond to a distance of 50 feet from the noisiest piece of equipment associated with a given phase of construction and 200 feet from the rest of the equipment associated with that phase.

SOURCE: U.S. Environmental Protection Agency (EPA), 1971. *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances*.

TABLE 3.12-2
TYPICAL NOISE LEVELS FROM CONSTRUCTION EQUIPMENT

Construction Equipment	Noise Levels (dBA at 50 feet)	
	Without Noise Control	With Feasible Noise Control [a]
Earthmoving		
Front Loaders	79	75
Backhoes	85	75
Dozers	80	75
Tractors	80	75
Scrapers	88	80
Graders	85	75
Trucks	91	75
Pavers	89	80
Material Handling		
Concrete Mixers	85	75
Concrete Pumps	82	75
Cranes	83	75
Derricks	88	75
Stationary Equipment		
Pumps	76	75
Generators	78	75
Compressors	81	75
Impact Equipment		
Pile Driver	101	95
Jack Hammer	88	75
Rock Drills	98	80
Pneumatic Tools	86	80
Other		
Saws	78	75
Vibrators	76	75

a. Feasible noise controls represent estimates obtained by using quieter procedures or equipment and noise control features that would require no major design or extreme cost. Quiet equipment can be designed with enclosures, mufflers, or noise-reduction features.

SOURCE: Bolt, Baranek and Newman, 1971

The noise levels shown in Table 3.12-1 represent composite noise levels associated with typical construction activities, which take into account both the number of pieces and spacing of heavy construction equipment that are typically used during each phase of construction. These estimated maximum noise levels would not be continuous, nor would they be typical of noise levels throughout the construction period. These noise levels would diminish notably with distance from the construction site at a rate of 6 dBA per doubling of distance. For example, a noise level of 84 dBA Leq measured at 50 feet from the noise source to the receptor would reduce to 78 dBA Leq at 100 feet from the source to the receptor, and reduce by another 6 dBA Leq to 72 dBA Leq at 200 feet from the source to the receptor.

The nearest sensitive receptor to the Stockdale East and Stockdale West properties are single-family residences located on the north side of Stockdale Highway. The boundaries of these properties are approximately 800 feet from the property line of Stockdale West and approximately 200 feet from the property line of Stockdale East. The nearest sensitive receptor to

the Central Intake alignment is a residential property on the north side of Stockdale Highway approximately 300 feet west of the pipeline construction easement near the railroad crossing. Construction at Stockdale West would primarily involve well drilling, which would occur at a setback of approximately 880 feet from Stockdale Highway as shown in Figure 2-2. Noise levels due to well drilling would be 98 dBA at 50 feet without noise controls. Given the distance of the nearest residences from the project area, noise levels at a distance of 1600 feet from well drilling activities would be approximately 62 dBA. Construction at Stockdale East would also include well drilling as well as excavation to form recharge basins. Noise levels due to excavation would be 89 dBA at 50 feet without noise controls. At the nearest residences approximately 200 feet away, noise levels associated with excavation would be approximately 77 dBA. Noise levels associated with well drilling would be approximately 71 dBA at a distance of 1080 feet considering the required setback. Construction of the Central Intake would primarily involve excavation as well tunneling under Stockdale Highway and the railroad. Noise levels due to excavation at the nearest sensitive receptor 300 feet away would be approximately 74 dBA. Noise levels due to tunneling would be approximately 83 dBA. The third Stockdale project site would be identified within the additional site radius which encompasses primarily agricultural uses but also residential and commercial uses on the eastern portion of the area.

Kern County does not have regulations restricting construction noise levels. Therefore, construction activities at any of the Stockdale Properties or the Central Intake that would be in proximity to sensitive receptors would be operating in compliance with noise standards as set forth by the County and City.

In addition, construction activities associated with the proposed project would be short-term and phased and would be required to comply with the noise regulations as stated in the County Municipal Code. Construction activity for the proposed project would generally occur between 7:00 a.m. and 6:00 p.m., Monday through Friday, which would not violate the construction hours established in the County Municipal Code. The Kern County Code prohibits noise-producing construction activities that are audible to a person with average hearing ability within 150 feet of the construction site, or within 1,000 feet of an occupied residential dwelling, between the hours of 9:00 p.m. to 6:00 a.m. on weekdays, and 9:00 p.m. to 8:00 a.m. on weekends. All construction activities for the proposed project would not violate these restrictions. The only construction activity proposed beyond 9:00 p.m. would be 24-hour well drilling; however all proposed well drilling on Stockdale East and Stockdale West would be at a greater distance than 1,000 feet from any occupied residential dwelling. As such, construction-related noise would not exceed established noise standards and would be considered less than significant.

Operational activities would be passive and include movement of water through pipes and canals. Potential noise sources during operation may include the pump station and noise associated with vehicular trips for maintenance and monitoring activities. Maintenance would involve activities such as clearing debris and dredging recharge basins and vegetation management activities. Recharge basin maintenance would require transportation of minimal heavy equipment to the project site (e.g., backhoe and front loader) and a small maintenance crew. However, maintenance and monitoring activities would occur infrequently and are not anticipated to generate excessive noise that may impact sensitive receptors.

Impact Determination

Construction activities at the Stockdale Properties and the Central Intake would result in a temporary increase in noise levels in the project vicinity. Noise levels would be in accordance with the City and County noise standards for construction; there are no regulations restricting construction noise levels. Operational activities would not significantly increase noise levels and would not create noise impacts. Therefore, the proposed project would not expose sensitive receptors to noise levels in excess of established standards.

Significance Conclusion

Less than Significant.

Mitigation Measures

None required.

Threshold 2. Groundborne Vibration

Impact NOISE-2: The proposed project could generate or result in excessive groundborne vibration or groundborne noise levels.

As shown in **Table 3.12-3**, use of heavy equipment (e.g., a large bulldozer) generates vibration levels of 0.031 PPV or 81 RMS at a distance of 50 feet. Ground-borne vibration attenuates quickly with distance; the RMS level from heavy equipment would be below the 80 RMS standard at about 60 feet, where RMS would be equal to 79. (The FTA has identified the human annoyance response to vibration levels as 80 RMS.) In addition, as shown in Table 3.12-3, vibration levels at 50 feet from heavy equipment would not exceed the potential building damage threshold of 0.5 PPV. Generally, given these distances, vibration levels would not be perceptible outside of the project construction areas at the Stockdale Properties and the Central Intake, given the requirements for setbacks from property boundaries. Additionally, there are no sensitive receptors located within 60 feet of Stockdale East, Stockdale West, or the Central Intake. The nearest sensitive receptor is approximately 200 feet from Stockdale East, 300 feet from the Central Intake alignment and 800 feet from Stockdale West. Construction-related vibration impacts would be less than significant.

TABLE 3.12-3
VIBRATION VELOCITIES FOR CONSTRUCTION EQUIPMENT

Equipment	PPV at 50 ft (inches/second)[a]	RMS at 50 ft (VdB)[b]
Large bulldozer	0.031	81
Caisson drilling	0.031	81
Loaded trucks	0.027	80

[a] Fragile buildings can be exposed to ground-borne vibration levels of 0.5 PPV without experiencing structural damage.
[b] The human annoyance response level is 80 RMS.

SOURCE: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, May 2006.

Operation of the proposed project would not have any components that would generate substantial vibration. Thus, impacts associated with vibration would be less than significant.

Impact Determination

The use of heavy equipment during construction at the Stockdale Properties and the Central Intake alignment would not exceed the vibration thresholds for human annoyance or for building damage due to attenuation and distance of sensitive receptors and structures. Impacts due to groundborne vibration would be less than significant.

Significance Conclusion

Less than Significant.

Mitigation Measures

None required.

Threshold 3. Permanent Ambient Noise Levels

Impact NOISE-3: The proposed project could result in a substantial permanent increase in ambient noise levels in the project vicinity.

Operation of the proposed project facilities would be primarily characterized by movement of water through pipes, canals, and basins. Potential noise sources during operation may include the pump station and noise associated with vehicular trips for maintenance and monitoring activities. Maintenance would involve activities such as clearing debris and dredging recharge basins and vegetation management activities. Recharge basin maintenance would require transportation of minimal heavy equipment to the project site (e.g., backhoe and front loader) and a small maintenance crew. However, maintenance activities would occur infrequently and are not expected to substantially increase ambient noise levels in the area above existing levels without the proposed project. Monitoring activities would also be periodic and would not create a substantial increase in ambient noise levels.

Impact Determination

Operation of the proposed project would result in passive noise and include movement of water through pipes, canals, and basins. Noise generated by the proposed project facilities would be minimal and would not significantly increase ambient noise levels. Other operational activities would include routine maintenance and monitoring activities that would require the transportation of minimal heavy equipment to the project site, workers, and truck trips. Maintenance and monitoring activities would be infrequent and would not substantially increase ambient noise levels. Therefore, impacts to permanent ambient noise levels would be less than significant.

Significance Conclusion

Less than Significant.

Mitigation Measures

None required.

Threshold 4. Temporary Ambient Noise Levels

Impact NOISE-4: The proposed project could result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity.

As discussed above under Impact NOISE-1, noise temporarily generated during construction would not be subject to any noise standards or thresholds under the County regulations. Nonetheless, construction noise would result in a temporary or periodic increase in ambient noise levels in the project vicinity. As discussed previously, noise levels at the nearest sensitive receptors, which are approximately 800 feet north of Stockdale West, 200 feet north of Stockdale East, and 300 feet west of the Central Intake alignment, would be approximately 62 dBA during well drilling at Stockdale West, approximately 77 dBA during excavation at the northern boundary of Stockdale East, and approximately 74 dBA during excavation for the Central Intake. Noise levels due to tunneling under the railroad would be approximately 83 dBA. The exterior noise level established by the Kern County Noise Ordinance is 65 dBA. Construction noise would be below this level at sensitive receptors during project construction on Stockdale West, and as such, temporary increases in ambient noise would not be significant. Construction noise would be above this level at sensitive receptors along the northern boundary of Stockdale East and west of the Central Intake alignment. However, baseline conditions at Stockdale East include agricultural operations along with associated use of heavy farm machinery, such as tractors. It has been documented that noise from tractors can range from 85 dBA to 91 dBA (Bean, 2008). Such noise levels are similar to that associated with proposed construction activities, both in dBA and the intermittent time periods that such noise is generated. Thus, temporary increases in ambient noise levels due to project construction would be considered less than significant. No mitigation is required.

The location of the third Stockdale project site is not known and could be located in close proximity to residential land uses. As such, sensitive receptors could be exposed to substantial temporary increase in ambient noise level. To mitigate for such temporary noise, **Mitigation Measure NOISE-1** would require the construction contractor to locate equipment directed away from sensitive receptors, and maintain noise controls on standard construction equipment. With the implementation of Mitigation Measures NOISE-1, temporary construction noise impacts would be considered less than significant.

Impact Determination

Construction noise would expose sensitive receptors to temporary increases in ambient noise levels. Such noise impacts would be reduced to less than significant levels with implementation of noise controls on construction equipment and other best practices as required by NOISE-1. Impacts would be less than significant with mitigation.

Significance Conclusion

Less than Significant with Mitigation.

Mitigation Measures

NOISE-1: To reduce temporary construction related noise impacts at the third Stockdale site, the following shall be implemented by the construction contractor:

a. Place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site.

b. Locate equipment staging in areas that will create the greatest possible distance between construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction.

c. Ensure proper maintenance and working order of equipment and vehicles, and that all construction equipment is equipped with manufacturers approved mufflers and baffles.

d. Install sound-control devices in all construction and impact equipment, no less effective than those provided on the original equipment.

References – Noise

Bean, Thomas L., 2008. *FACT SHEET: Agriculture and Natural Resources, Noise on the Farm Can Cause Hearing Loss*. The Ohio State University Extension, AEX-590-08.

Bolt, Baranek, and Newman, 1971. *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances.*

California Department of Transportation (Caltrans), 1998. Technical Noise Supplement. October, 1998.

Federal Energy Regulatory Commission (FERC), 2002. *California State Lands Commission, Kern River 2003 Expansion Project, Draft Environmental Impact Statement/Environmental Impact Report.*

Federal Railway Administration (FRA), 1998. High-Speed Ground Transportation Noise and Vibration Impact Assessment.

Federal Transit Administration (FTA), 2006. *Transit Noise and Vibration Impact Assessment.*

Kern County Planning Department, 2010. *Kern County General Plan Noise Element.*

United States Environmental Protection Agency (EPA), 1971. *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances.*

United States Environmental Protection Agency (EPA), 1978. *Protective Noise Levels. Condensed Version of USEPA Levels Document, USEPA 550/9-79-100.*

3.13 Transportation and Traffic

This chapter describes the existing transportation networks and traffic conditions in the project vicinity and the applicable regulatory framework. The effects of the proposed project on transportation and traffic are primarily temporary impacts during project construction.

3.13.1 Environmental Setting

Roadway Network

The project site is located in rural Kern County in the southern San Joaquin Valley west of Bakersfield, California. Kern County is a major transportation corridor that includes trucking routes, passenger vehicles, and railways. The roadway system in Kern County has been operating at acceptable conditions with isolated incidence of crowding. Kern County's roadway facilities consist of approximately 6,300 miles of highway. Together, Interstate 5 and the State highway system provide inter-regional connectivity to the project area from all directions (**Figure 3.13-1)**. Interstate 5 (I-5), State Route 99 (SR-99), and State Route 43 (SR-43) provide north-south access to the project area, and State Route 46 (SR-46) and State Route 58 (SR-58) provide east-west access to the project area. The project area also includes secondary arterial, collector, and local roads that serve regional and local transportation needs:

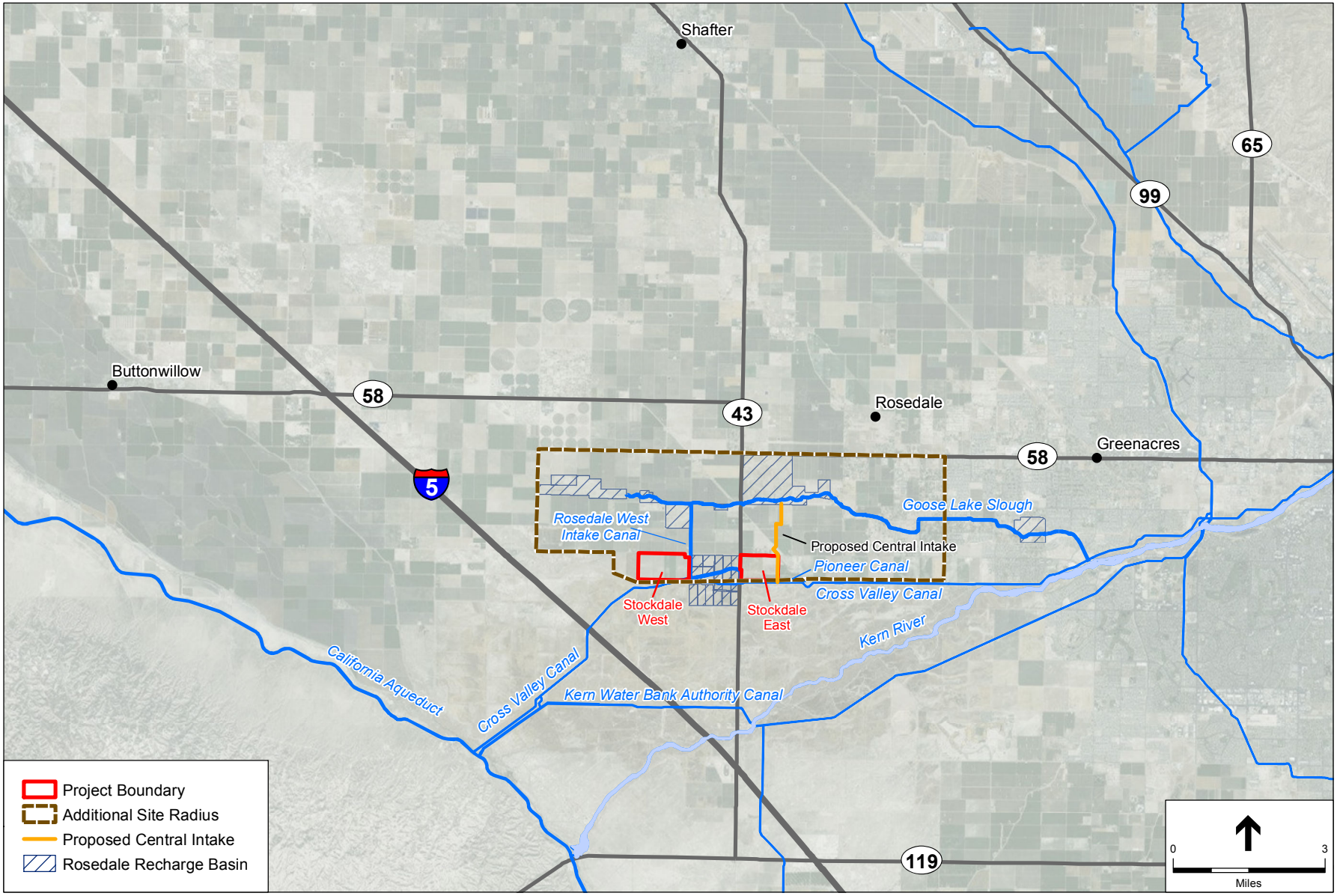
I-5 is a major north-south freeway that runs from the Mexican to Canadian border, connecting California, Oregon, and Washington. I-5 is approximately 8.5 miles from the project site.

SR-99 branches from I-5 south of Bakersfield and continues north through Fresno to Sacramento. SR-99 is a six-lane freeway in Kern County with sections of eight-lanes as it travels through Bakersfield.

SR-43 is a north-south trending highway that connects the towns of Shafter, Wasco, Hanford, and Selma. It runs parallel to SR-99. The route begins southwest of Bakersfield at the intersection of SR-119 and Enos Lane through rural farmland. SR-43 runs adjacent to Stockdale East and runs through the Stockdale additional site radius.

SR-46 begins at SR-99 and travels west through Wasco, into San Luis Obispo County over the Coast Range, through Paso Robles, and ending at U.S. Highway 1 near the coast. SR-46 is approximately 27 miles from the project site.

SR-58 begins in San Luis Obispo County, travels east through Kern County through Bakersfield and Mojave, and ends in San Bernardino County. SR-58 is approximately 13 miles from the project site.



SOURCE: ESRI 2013

Stockdale Integrated Banking Project . 211181

Figure 3.13-1

Regional Roadways

Truck Routes

Truck traffic contributes between 20 to 30 percent of traffic on Kern County roads (Kern County Planning Department, 2009). Several highways in Kern County consist of 30 percent of truck trips with a total County average truck vehicle miles traveled (VMT) of about 24 percent, which is higher than the state average of 10 percent. Most trucks traveling through Kern County are interstate carriers; interstate trucking is controlled and regulated by the California Department of Transportation (Caltrans).

Public Transit

Golden Empire Transit (GET) provides transit bus service to the Metropolitan Bakersfield area, including 88 buses and 20 routes (GET, 2012). Kern Regional Transit (KRT) provides transit bus service to outlying areas of Kern County with connections between Bakersfield, Wasco, Shafter, Buttonwillow, Kern River Valley, and other cities (Kern County Regional Transit Division, 2012). The Buttonwillow and Lost Hills-Bakersfield KRT routes are in the vicinity of the project site. KRT bus routes connect to GET but routes and to AMTRAK passenger trains. The AMTRAK station is located at Truxton Ave and S Street in Bakersfield. The AMTRAK San Joaquin Route originates in Bakersfield and connects to northern cities such as Fresno and Sacramento. There are no AMTRAK trains running south from Bakersfield (AMTRAK, 2007).

Two railroad lines cross through central Kern County, the Atchison, Topeka & Santa Fe Railroad (ATSFRR) and the Southern Pacific Railroad (SPRR) (Kern County Planning Department, 2009). Both lines run in a general north-south direction through Bakersfield. In the project vicinity, the Buttonwillow Branch of the SPRR runs west out of Bakersfield and crosses the Kern River, Cross Valley Canal, Stockdale Highway, and SR-58.

City and County Bikeways

Kern County developed and adopted the first Bikeways Plan in the mid 1970's that called for bicycle lanes on various streets, exclusive bike paths on canals, along railroad right-of-ways, and along the Kern River. The Kern County Bicycle Master Plan and Complete Streets Recommendations were adopted in September 2012. This plan also encompasses the Kern County Bicycle Facility Plan (2001). There are over 67 miles of existing bicycle facilities in the unincorporated parts of Kern County. This consists of over 25 miles of Class II Bike Lanes, over 38 miles of Class III Bike Routes, and three miles of Class I Bake Path along the Kern River. The Kern County Bicycle Master Plan proposes 751 miles of new bikeways. Over 30 miles of bike lanes exist along various streets including Stockdale Highway to California State University Bakersfield and surrounding main streets in Bakersfield (Kern COG, 2011). Bicycle facilities are classified as follows:

Bike Path (Class I): separate right of way with exclusive use of bicycles and pedestrians with crossflow minimized.

Bike Lane (Class II): striped lane for one-way bike travel on street or highway, and

Bike Route (Class III): shared use with pedestrian or motor vehicle traffic.

The nearest bikeway, the Kern River Bikeway, is a Class I bike path stretching over 12.3 miles through Bakersfield and is a major component of the Kern River Parkway. The Kern River Bikeway will be used as a backbone of a regional bikeway system.

Level of Service

Level of service (LOS) measures the quality of service provided by a roadway and is used to correlate quantitative traffic-volume data to qualitative descriptions of traffic performance at intersections. LOS criteria for roadways account for numerous variables, including annual average daily traffic, roadway capacity, grade, and environment (urban versus rural). **Table 3.13-1** provides a description of LOS categories "A" through "F" for intersections and highway capacity as defined by the Transportation Research Board (TRB, 2002). Within Kern County, county-maintained roads must achieve at least LOS D. The Caltrans standard for State highways is LOS C and LOS D (Kern County Planning Department, 2009).

Stockdale Highway is an east-west trending highway maintained by the County. Stockdale Highway experiences annual average daily traffic (AADT) of approximately 6,471 in the project vicinity (east of SR-43) (Kern Council of Governments, 2014).

Brimhall Road is an east-west trending roadway maintained by the County. Brimhall Road experiences AADT of approximately 610 in the project vicinity (east of SR-43) (Kern Council of Governments, 2014).

SR-43/Enos Lane is a north-south trending highway. SR-43 is maintained by Caltrans, experiences an AADT of approximately 5,900 in the project vicinity (junction of SR-58) (Caltrans, 2014).

I-5 Freeway is a north-south trending highway maintained by Caltrans. I-5 experiences AADT of 34,500 in the project vicinity (Stockdale Road) (Caltrans, 2014).

TABLE 3.13-1
LEVEL OF SERVICE DEFINITIONS

LOS Rating	Description	Signalized Intersections Delay (sec)	Highway Capacity Ratio
A	Free Flow. No approach phase is fully used by traffic and no vehicle waits longer than one red indication. Insignificant delays.	0-16	0.0-0.59
B	Stable Operation. An occasional approach phase is fully used. Many drivers begin to feel somewhat restricted within platoons of vehicles. Minimal delays.	16-22	0.6-0.69
C	Stable Operation. Major approach phase may become fully used. Most drivers feel somewhat restricted. Acceptable delays.	22-28	0.7-0.79
D	Approaching Unstable. Drivers may have to wait through more than one red signal cycle. Queues develop but dissipate rapidly, without excessive delays.	28-35	0.8-0.89
E	Unstable Operation. Volumes at or near capacity. Vehicles may wait through several signal cycles. Long queues form upstream from intersection. Significant delays.	35-40	0.9-0.99
F	Forced Flow. Represents jammed conditions. Intersection operates below capacity with several delays; may block upstream intersections.	greater than 40	N/A

SOURCE: TRB, 2002.

3.13.2 Regulatory Setting

The development and regulation of the transportation network in the vicinity of the proposed project primarily involves state and local jurisdictions. All roads within the project area are under the jurisdiction of state and local agencies. Applicable state and local laws and regulations related to traffic and transportation issues are discussed below.

State

California Department of Transportation (Caltrans)

Caltrans manages interregional transportation, including management and construction of the California highway system. In addition, Caltrans is responsible for permitting and regulation of the use of state roadways. The project area includes roadways that fall under Caltrans' jurisdiction (e.g., I-5, SR-99, and SR-43). Caltrans' construction practices require temporary traffic control planning "during any time the normal function of a roadway is suspended" (FHWA, 2008). In addition, Caltrans requires that permits be obtained for transportation of oversized loads and transportation of certain materials, and for construction-related traffic disturbance.

Local

Kern County Circulation Element

The proposed project is located within Kern County and is governed by the Kern County General Plan (Kern County Planning Department, 2009). The Circulation Element of the County General Plan includes goals and policies for transportation planning and development of facilities to support development in a manner that avoids traffic degradation, reduces environmental effects, and maintains quality of life (Kern County Planning Department, 2009). The County has set a goal of maintaining a minimum LOS D for all roads throughout the County.

Kern County Traffic Department, Traffic Engineering Division

The Kern County Traffic Engineering Division has responsibility for growth and transportation planning issues, rural public transportation planning, and development review. This division coordinates with Kern Council of Governments, Caltrans and other agencies to procure project funding. They also review transportation-related issues on land development matters, developer fees and areas of benefit.

Kern Council of Governments Congestion Management Program

All urbanized areas with a population larger than 200,000 are required to have a Congestion Management System, Program, or Process. The Kern Council of Governments (COG) refers to its congestion management activities as the Congestion Management Program (CMP). Kern COG was designated as the Congestion Management Agency. The CMP is a systematic process for managing congestion that provides information on: (1) transportation system performance, and (2) alternative strategies for alleviating congestion and enhancing the mobility of persons and goods to levels that meet state and local needs.

The purpose of the CMP is to help ensure that a balanced transportation system is developed that relates population growth, traffic growth and land use decisions to transportation system LOS performance standards and air quality improvement. The CMP is an effort to more directly link land use, air quality, transportation and the use of new advanced transportation technologies as an integral and complementary part of this region's plans and programs.

The purpose of defining the CMP network is to establish a system of roadways that will be monitored in relation to established LOS standards. At a minimum, all state highways and principal arterials must be designated as part of the Congestion Management System of Highways and Roadways. Kern County has 18 designated state highways.

2011 Regional Transportation Plan

The Regional Transportation Plan (RTP) was prepared by the Kern COG, and was adopted in July 2010. The 2011 RTP is a 24-year blueprint that establishes a set of regional transportation goals, policies, and actions intended to guide development of the planned multimodal transportation systems in Kern County. It was developed through a continuing, comprehensive, and cooperative planning process, and provides for effective coordination between local, regional, state, and federal agencies. Kern COG prepared the 2011 RTP to include the CMP, which is designed to ensure that a balanced transportation system is developed, relating population and traffic growth, land use decisions, performance standards and air quality improvements. Additionally, the RTP establishes a basis on which funding applications are evaluated. Use of any state or federal transportation funds by local governments must conform to the RTP, the State Implementation Plan (SIP) for air quality improvements, and the Federal Transportation Improvement Program (FTIP) (Kern COG, 2011).

Kern County Airport Land Use Compatibility Plan (ALUCP)

The Kern County ALUCP establishes procedures and criteria to assist Kern County and affected incorporated cities in addressing compatibility issues for the proposed project regarding airports and the land uses around them. The nearest airport to the project site is Joe Gottlieb Field, a private airfield, located approximately 5.5 miles to the west. The nearest public airport is Elk Hills-Buttonwilliow Airport approximately 15 miles west of the project site. Meadows Field Airport, approximately 20 miles northeast of the project site and is the primary commercial and international airport serving the county and the San Joaquin Valley. The project site is not within the Kern County ALUCP.

3.13.3 Impact Assessment

Thresholds of Significance

The following criteria from Appendix G of the *CEQA Guidelines* are used as thresholds of significance to determine the impacts of the proposed project as related to transportation and traffic. The proposed project would have a significant impact if it would:

1. Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the 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.

2. 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 roads or highways.
3. 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.
4. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
5. Result in inadequate emergency access.
6. Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

Effects Found Not to be Significant

Threshold 3. Air Traffic Patterns

The proposed project does not include new or altered airport facilities and would not affect air traffic patterns. There would be no impact.

Threshold 6. Alternative Transportation and Policies

Public transportation is supported by several public transit services include the GET and KRT transit bus service, and the AMTRAK train system. No GET or KRT transit bus stops are located in the project vicinity. The closest bikeway to the project area would be the Kern River Bikeway, which extends along the Kern River and is approximately three miles south of the project area. A Class II bike lane on Stockdale Highway also begins approximately four miles west from the Stockdale Properties, and approximately a half mile west from the potential third site radius boundary. Construction of the proposed project would require truck trips along Stockdale Highway; however, all staging areas and construction activities would be located onsite at the Stockdale Properties and are not anticipated to impact public transit, bicycle, or pedestrian facilities. As the Kern River Bikeway and bike lane is more than three miles from the project area, the bikeway facility would not be impacted by project construction or operation. Therefore, impacts to alternative transportation and policies and plans would not occur.

Impacts and Mitigation Measures

Threshold 1. Traffic Circulation

Impact TR-1: The proposed project could conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system.

During project construction, additional vehicles would be added to local and regional roadways for purposes of construction worker commutes and delivery of construction equipment and

materials. Construction of the proposed project would require up to twenty construction workers during each construction phase. Other construction-related vehicles would include water trucks, flat-back delivery trucks, and 10-wheel dump trucks. Other large construction equipment and vehicles would be delivered to the site via flat-bed trucks. Construction-related vehicles would travel to and access the project sites via Stockdale Highway, SR-43/Enos Lane, and the I-5 Freeway. All construction vehicles and equipment would be staged onsite at the Stockdale Properties.

The Stockdale Highway, SR-43/Enos Lane, and the I-5 Freeway currently experience AADTs of 6,471, 5,900, and 34,500, respectively, in the project area (Caltrans, 2014). The daily increase of 20 construction worker commutes is not anticipated to affect the performance of the circulation system, as the increase in AADTs would be less than one percent on each roadway. Other construction-related vehicles would be delivered to the project sites and remain staged onsite for the duration of a construction phase and would not affect local traffic or circulation. Construction of the Central Intake Pipeline would require trenching across Brimhall Road, which would require short-term lane or road closures or detours. Jack and bore methods would be used to tunnel under Stockdale Highway and avoid disturbance of this roadway. Trenching across Brimhall Road would take no longer than two weeks. Implementation of **Mitigation Measure TR-1** would require inclusion of measures into the project's Construction Traffic Control Plan that ensure Rosedale provides signage and flagging to alert motorists of pending lane or road closures and detours. Given the short-term nature of such an effect on traffic flow, the effect of lane or roadways closures or detours on roadways circulation would be considered less than significant. Because construction of the proposed project would not substantially increase traffic on nearby roadways, the proposed project would not conflict with any applicable plans, ordinances, or policies that establish measures of effectiveness for the performance of the circulation system around the project site. Therefore, the construction phase of the proposed project would have a less than significant impact on traffic circulation.

Project operation would result in infrequent trips related to maintenance and monitoring activities at the project sites. Occasional maintenance and monitoring activities, such as clearing debris and dredging recharge basins, would not substantially increase traffic in the project area. During project operation, monitoring crews would visit the project site periodically to perform routine inspections of conveyance structures, recharge basins, wells, pumps, and other project facilities. Project monitoring would require minimal visits to the site and would not substantially affect surrounding roadways. Recharge basin maintenance would require transportation of minimal heavy equipment to the project site (e.g., backhoe and front loader) and a small maintenance crew. The increase of vehicle trips would be minimal and would not substantially increase traffic volumes on Stockdale Highway or other adjacent roadways and highways.

The operations phase of the proposed project would not impact the existing LOS of project-related roadways, and project implementation would not conflict with the goals set forth by the Kern County General Plan or any other applicable ordinance or policy that set forth to measure the effectiveness of the circulation system in the vicinity of the project site. Therefore, the

operations phase of the proposed project would have a less than significant impact on traffic circulation.

Impact Determination

Construction and operation of the proposed project would not substantially alter traffic volume on roadways in the project vicinity. During construction of the Central Intake Pipeline across Brimhall Road, implementation of Mitigation Measure TR-1 would ensure motorists are aware of short-term lane or road closures or detours. The proposed project would not conflict with applicable policies or ordinances establishing effectiveness for the performance of the circulation system. Impacts would be less than significant.

Significance Conclusion

Less than Significant with Mitigation.

Mitigation Measures

TR-1: For project features that require open-trench construction across roadways, the Construction Traffic Control Plan for the proposed project shall include measures that ensure Rosedale provides signage and flagging to alert motorists of pending and actual lane or road closures and detours. Such measures shall conform to the requirements of the Kern County Roads Department and any requirements of related encroachments permits.

Threshold 2. Level of Service Standards

Impact TR-2: The proposed project could conflict with an applicable congestion management program and reduce the level of service of surrounding roads and highways.

In general, LOS standards for roadways are intended to regulate long-term traffic increases resulting from the operation of new development, and do not apply to temporary construction projects. Therefore, for the proposed project, temporary construction-generated traffic would not result in any long-term degradation in operation conditions of LOS on any nearby roadways Operation of the proposed project would generate minimal traffic as a result of occasional truck trips related to onsite maintenance and monitoring activities. As a result, the proposed project would maintain the current levels of service on roadways surrounding the Stockdale Properties. The proposed project would be in compliance with established Kern County General Plan LOS Standards. Therefore, impacts related to congestion and levels of service to surrounding roads and highways would be less than significant, and no mitigation is required.

Impact Determination

Operation of the proposed project would result in a minimal increase of maintenance vehicle trips on Stockdale Highway, SR-43, and other surrounding roadways. The increase in vehicle trips would not affect the existing level of service. There would be no conflict with applicable congestion management programs, and no mitigation is required.

Significance Conclusion

Less than Significant.

Mitigation Measures

None required.

Threshold 4. Hazardous Design Features

Impact TR-3: The proposed project could result in a substantial increase to hazards due to a design feature or incompatible uses.

Project construction would require the delivery of heavy construction equipment that may require transportation by oversize vehicles on roadways. The use of oversize vehicles could create a hazard to the public by limiting views on the roadways, obstructing space, and reducing travel speed on the roadway. To ensure that construction-related oversize vehicle loads and travel are in compliance with applicable California Vehicle Code sections and California Street and Highway Codes applicable to licensing, size, weight, load, and roadway encroachment of construction vehicles, the construction contractor would prepare a Construction Traffic Control Plan that conforms to requirements of the Kern County Roads Department and the California Department of Transportation District 6. The Construction Traffic Control Plan would identify construction delivery times and vehicle travel routes in advance to minimize construction traffic during peak a.m. and p.m. hours. The preparation and approval of the Construction Traffic Control Plan would further reduce construction-related traffic and roadway hazards in the project vicinity. **Mitigation Measure TR-2** would ensure the Construction Traffic Control Plan is developed prior to construction for approval.

The third Stockdale project site has not yet been determined but would be located within the additional site radius. The Rio Bravo Greeley School located at 6601 Enos Lane, is adjacent to the northern boundary of the additional site radius at the cross streets of Enos Lane and Rosedale Highway. In the event the third Stockdale project site is to be located within a quarter mile of the school, impacts related to the construction and operation of the proposed project could occur. Implementation of **Mitigation Measure HAZ-4** would require coordination with the Rio Bravo-Greeley Union School District to determine a haul route that would not impact existing school safety routes.

Impact Determination

The transportation of construction-related equipment may require the use of oversize vehicles. The construction contractor would prepare a Construction Traffic Control Plan for approval to ensure construction-related oversize vehicle loads and travel are in compliance with applicable California Vehicle Code sections and California Street and Highway Codes. Mitigation Measure TR-2 would ensure the Construction Traffic Control Plan is prepared and implemented. Mitigation Measure HAZ-4 would require coordination with the Rio Bravo-Greeley Union School District, if the third Stockdale project site is within 0.25 miles of a school, to determine a haul route that would not impact

existing school safety routes. Operation of the proposed project would not increase hazards due to project design features. Therefore, impacts would be less than significant with mitigation.

Significance Conclusion

Less than Significant with Mitigation.

Mitigation Measures

TR-2: IRWD and Rosedale shall require the construction contractor to prepare and implement a Construction Traffic Control Plan that conforms to requirements of the Kern County Roads Department, California Department of Transportation District 6, and the California Department of Transportation Manual on Uniform Traffic Control Devices and Work Area Traffic Control Handbook. The construction contractor shall obtain all necessary permits for the work within the road right-of-way or use of oversized/overweight vehicles that will utilize county maintained roads, which may require California Highway Patrol or a pilot car escort.

Implement **Mitigation Measure HAZ-4**.

Threshold 5. Emergency Access

Impact TR-4: The proposed project could result in inadequate emergency access.

The Stockdale Properties and the Central Intake alignment are located in a rural agricultural area with adequate egress and ingress to the sites via Stockdale Highway, Rosedale Highway, Enos Lane (SR-43), Brimhall Road, and Superior Road in the event of an emergency. Construction of the Central Intake Pipeline would be accomplished using trenching construction techniques across Brimhall Road, which may require temporary lane closures or a detour. The Central Intake Pipeline crossings of Stockdale Highway and the Southern Pacific Railroad would utilize jack and bore techniques to avoid disruption of surface transportation features. The proposed project would not require public road closures that could impact access by emergency vehicles. However, construction-related traffic could affect emergency response to the project site and surrounding vicinity. A pet resort business and several residences are located near the Stockdale East site. The third Stockdale project site similarly could be located near residential land uses. To ensure emergency access is not impacted during construction in the project vicinity, Rosedale and IRWD would require the construction contractor to prepare a Construction Traffic Control Plan that would include assurance of access for emergency vehicles to the project site. Mitigation Measure TR-2 would ensure the Construction Traffic Control Plan is prepared and implemented by the contractor.

Dirt roads would be constructed at Stockdale East and the third property and run along the perimeter of and in between all basins for access during operation and maintenance activities. Similar dirt roads currently exist at the Stockdale West property. These dirt roads would be constructed and accessible for emergency access within the project site, if necessary.

Impact Determination

Preparation and implementation of a Construction Traffic Control Plan in accordance with Mitigation Measure TR-2 would ensure emergency access is not impacted during construction. Proposed and existing dirt roads around and in between the project recharge basins would also accommodate emergency vehicles and access in case of emergencies at the Stockdale properties. Therefore, impacts to emergency access would be less than significant.

Significance Conclusion

Less than Significant with Mitigation.

Mitigation Measures

Implement **Mitigation Measure TR-2**.

References – Transportation and Traffic

AMTRAK, 2007. San Joaquins: Oakland/Sacramento – Bakersfield/Southern California. Accessed at www.amtrak.com.

California Department of Transportation (Caltrans), 2013. District 6 Project Fact Sheets. Accessed at http://www.dot.ca.gov/dist6/factsheets/index.htm#sr99.

Caltrans, 2014. *2012 Traffic Volumes on the California State Highway System*. Accessed at http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/2012TrafficVolumes.pdf, on March 14, 2014.

Federal Highway Administration (FHWA), 2008. U.S. Department of Transportation, Office of Highway Safety, Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways.

Golden Empire Transit (GET), 2012. Golden Empire Transit District System Map. Accessed at www.getbus.org.

Kern Council of Governments (COG), 2011. Final Regional Transportation Plan (RTP).

Kern Council of Governments (COG), 2014. Regional Traffic County Data Map; Local Road Traffic Count Lookup. Accessed at http://www.kerncog.org/data-center/regional-traffic-count-data-map, on March 14, 2014.

Kern County Bicycle Master Plan and Complete Streets Recommendations were adopted in September 2012

Kern County Planning Department, 2009. *Kern County General Plan Circulation Element*.

Kern County Regional Transit Division, 2012. Kern Regional Transit Schedules. Accessed at http://roads.kerndsa.com/bus-services.

Kern County Traffic Department, 2013. Traffic Counts. Accessed at http://roads.kerndsa.com/images/pdfs/Traffic_Counts.pdf

Kern County, 2011. *Kern County Airport Land Use Compatibility Plan (ALUCP).*

Transportation Research Board (TRB), 2002. Highway Capacity Manual, Special Report 209.

3.14 Utilities and Energy

This chapter describes the existing utilities and energy in the vicinity of the proposed project and determines the potential impacts that would occur with project implementation.

3.14.1 Environmental Setting

Water

The majority of Metropolitan Bakersfield is served by the California Water Service Company (CWSC), a privately held public utility, which obtains its water supply principally from wells and is supplemented by the Kern County Water Agency (KCWA). Currently, water utilized at Stockdale East and Stockdale West is supplied by on-site agricultural wells. Additional information about these wells is provided in **Chapter 3.9, Hydrology and Water Quality**.

Water supply for the Metropolitan Bakersfield area is provided through both surface water and groundwater, each of which has several sources. Surface water supply for the Metropolitan Bakersfield areas comes from the Kern River and SWP, all of which must be treated prior to distribution (City of Bakersfield and Kern County, 2002). There are currently three surface water treatment plants in Metropolitan Bakersfield, one facility owned and operated by the KCWA Improvement District 4 with a peak capacity of 90 mgd, and two CWSC treatment plants with 20 mgd and 1.5 mgd (membrane) capacities. Each plant uses a combination of chemical addition, settling, filtration, and disinfection to produce water of acceptable quality.

The Southern San Joaquin Groundwater Basin and the primary groundwater aquifer below Metropolitan Bakersfield provide a substantial source of potable water to the Metropolitan Bakersfield area. Groundwater resources in the project area are described in greater detail in **Chapter 3.9, Hydrology and Water Quality**.

Wastewater / Sewer

The planning area is served by five major wastewater treatment facilities: the City of Bakersfield's Treatment Plant No. 2, the City's Treatment Plant No. 3, the North of River Sanitary District (NORSD) plant, Mount Vernon/Panorama District plant, and the Lamont Public Utility District plant, which is located outside the planning area. Neither Stockdale East, Stockdale West, nor the Central Intake alignment are connected to a local sewer system. The third Stockdale project site has yet to be determined but would be located within the site radius shown in Figure 2-2.

Solid Waste

Solid waste collection services (residential and commercial) are provided within the City of Bakersfield by the City Sanitation Division and contracted private haulers and, in the unincorporated area, by a county franchise hauler. All solid waste generated within the Metropolitan Bakersfield is disposed of in county-operated landfills. Currently two County

landfills are in operation to dispose of waste generated within Metropolitan Bakersfield: Bena and Shafter-Wasco. The landfills are located outside of City limits within Kern County.

Bena Landfill is located approximately 18 miles east of Bakersfield and is the primary landfill that serves Bakersfield. Currently the landfill has a maximum permitted capacity of 46,239,605 cubic yards and the current daily limits are 1,150 tons per day. In 2013, the remaining capacity was 33,144,497 cubic yards. The landfill will go inactive in 2046 (Personal communication, December 23, 2013).

Shafter-Wasco Landfill is located one mile north of Lerdo Highway on Scofield Avenue in Kern County. Currently the landfill has a maximum permitted capacity of 21,895,179 cubic yards and the current daily limits are 345 tons per day. In 2013, the remaining capacity was 14,729,755 cubic yards. The landfill will go inactive in 2059 (Personal communication, December 23, 2013).

Energy

The electrical system in Kern County is supplied by three of California's largest utilities: Pacific Gas & Electric (PGE), Southern California Edison, and Southern California Gas. PGE currently serves Stockdale East, Stockdale West, and the additional site radius identified for the third Stockdale project site and Central Intake (California Energy Commission, 2007). Electrical generation technologies present in Kern County include: cogeneration, wind energy, geothermal energy, biomass/transformation, solar energy, and hydroelectric.

3.14.2 Regulatory Setting

State

California Energy Commission (CEC)

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. Created in 1974, the CEC has five major responsibilities: forecasting future energy needs and keeping historical energy data, licensing thermal power plants 50 megawatts (MW) or larger, promoting energy efficiency through appliance and building standards, developing energy technologies and supporting renewable energy, and planning for and directing the state response to energy emergencies.

California Public Utilities Commission

The California Public Utilities Commission (CPUC) regulates privately owned electric, natural gas, telecommunications, water, railroad, rail transit, and passenger transportation companies, in addition to authorizing video franchises. In 1911, the CPUC was established by Constitutional Amendment as the Railroad Commission. In 1912, the Legislature passed the Public Utilities Act, expanding the Commission's regulatory authority to include natural gas, electric, telephone, and water companies as well as railroads and marine transportation companies. In 1946, the Commission was renamed the California Public Utilities Commission. It is tasked with ensuring

safe, reliable utility service is available to consumers, setting retail energy rates, and protecting against fraud.

2005 California Energy Action Plan II and 2008 Update

The California Energy Action Plan II is the state's principal energy planning and policy document (California Energy Commission, 2005 updated 2008). The plan identifies state-wide energy goals, describes a coordinated implementation plan for State energy policies, and identifies specific action areas to ensure that California's energy is adequate, affordable, technologically advanced, and environmentally sound. In accordance with this plan, the first priority actions to address California's increasing energy demands are energy efficiency and demand response (i.e., reduction of customer energy usage during peak periods in order to address system reliability and support the best use of energy infrastructure). Additional priorities include the use of renewable sources of power and distributed generation (i.e., the use of relatively small power plants near or at centers of high demand). To the extent that these actions are unable to satisfy the increasing energy and capacity needs, clean, and efficient fossil-fired generation is supported.

California Urban Water Management Planning Act

Section 10610 of the California Water Code establishes the Urban Water Management Planning Act. The act states that every urban water service provider that serves 3,000 or more customers or that supplies over 3,000 acre-feet of water annually should prepare an Urban Water Management Plan (UWMP) every five years. The goal of a UWMP is to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry years. IRWD certified its latest UWMP in November 2010.

Regional Water Quality Control Board (RWQCB)

The primary responsibility for the protection of water quality in California rests with the State Water Resources Control Board (SWRCB) and nine RWQCBs. The SWRCB sets statewide policy for the implementation of state and federal laws and regulations. The RWQCBs adopt and implement Water Quality Control Plans (Basin Plans) which recognize regional differences in natural water quality, actual and potential beneficial uses, and water quality problems associated with human activities. The project sites are within the jurisdiction of the Central Valley Region.

California Department of Toxic Substances Control (DTSC)

The DTSC regulates hazardous waste, cleans up existing contamination, and looks for ways to reduce the hazardous waste produced in California. Over 1,000 scientists, engineers, and specialized support staff make sure that companies and individuals handle, transport, store, treat, dispose of, and clean up hazardous wastes appropriately.

California Department of Water Resources (DWR)

The California DWR is a department within the California Resources Agency. The DWR is responsible for the State of California's management and regulation of water usage.

Integrated Solid Waste Management Act of 1989 (Public Resources Code 40050, et seq.) or Assembly Bill 939

Pursuant to the California Integrated Solid Waste Management Act of 1989, all cities in California are required to reduce the amount of solid waste disposed in landfills. Assembly Bill 939 required a reduction of 25 percent by 1995 and 50 percent by 2000. Contracts that include work that will generate solid waste, including construction and demolition debris, have been targeted for participation in source-reduction, reuse, and recycling programs. The contractor is urged to manage solid waste generated by the work to divert waste from disposal in landfills (particularly Class III landfills) and maximize source reduction, reuse, and recycling of construction and demolition debris.

California Solid Waste Reuse and Recycling Access Act of 1991 (California Public Resources Code Chapter 18)

The California Solid Waste Reuse and Recycling Access Act identified a lack of adequate areas for collecting and loading recyclable materials, resulting in a significant impediment to diverting solid waste. This act requires state and local agencies to address access to solid waste for source reduction, recycling, and composting activities. Each local agency must adopt an ordinance related to adequate areas for collecting and loading recyclable materials for development projects.

Local

Kern County General Plan

The Kern County General Plan provides guidance on public utilities and related services (Kern County, 2004). Sections of the plan that are relevant to the proposed project are included below.

1.4 Public Facilities and Services

Goal 1: Kern County residents and businesses should receive adequate and cost effective public services and facilities. The County will compare new urban development proposals and land use changes to the required public services and facilities needed for the proposed project.

Policy 1: New discretionary development will be required to pay its proportional share of the local costs of infrastructure improvements required to service such development.

Policy 3: Individual projects will provide availability of public utility service as per approved guidelines of the serving utility.

Implementation Measure C: Project developers shall coordinate with the local utility service providers to supply adequate public utility services.

Implementation Measure D: Involve utility providers in the land use and zoning review process.

Implementation Measure L: Prior to the approval of development projects, the County shall determine the need for fire protection services. New development in the County shall not be approved unless adequate fire protection facilities and resources can be provided.

Metropolitan Bakersfield General Plan EIR

The Metropolitan Bakersfield General Plan Update EIR provides background information on utilities and public services dealing with the present and planned land uses in the area, probable need for public facilities and services in the area, and the present capacity of public facilities and adequacy of public services.

The Metropolitan Bakersfield General Plan Update provides background information on utilities and public services dealing with the present and planned land uses in the area, probable need for public facilities and services in the area, and the present capacity of public facilities and adequacy of public services.

3.14.3 Impact Assessment

Thresholds of Significance

The following criteria from Appendix F and Appendix G of the *CEQA Guidelines* are used as thresholds of significance to determine the impacts of the proposed project as related to utilities and energy. The proposed project would have a significant impact if it would:

1. Exceed wastewater treatment requirements of the applicable Regional Water Quality Board;
2. 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;
3. 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;
4. Require new or expanded water supply resources or entitlements;
5. 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;
6. Be served by a landfill with insufficient permitted capacity to accommodate the project solid waste disposal needs; or
7. Not comply with federal, state, and local statutes and regulations related to solid waste.
8. Result in a substantial increase in overall or per capita energy consumption.
9. Conflict with applicable energy efficiency policies or standards.

Effects Found Not to be Significant

Thresholds 1 / 2 / 5. Wastewater Treatment and Wastewater Facilities

No new water, wastewater treatment, or septic systems would be constructed as a result of the proposed project. The proposed project would not permanently increase wastewater generation in the project area and would not be subject to wastewater treatment requirements of the Central Valley Regional Water Quality Control Board. The proposed project would not produce wastewater and would not require a wastewater treatment provider to serve the project. Therefore, the proposed project at Stockdale East, Stockdale West, the Central Intake, and the third Stockdale project site would have no impact on wastewater treatment facilities.

Threshold 3. Stormwater Facilities

The proposed project would construct new recharge basins at Stockdale East and the third Stockdale project site. These basins would be constructed similar to the existing basins on Stockdale West, with the bottom of the basin below grade and earthen berms built up above grade to contain water to be recharged. The existing and proposed basins associated with the proposed project would contain any storm water onsite at the Stockdale Properties. The project would also include construction of the Central Intake Pipeline, which would be located below the ground surface and thereby would not contain storm water runoff. There would be no increase in storm water runoff that would require construction or expansion of storm water drainage facilities. No storm water facilities would be constructed and as such no corresponding environmental effects would occur.

Threshold 7. Solid Waste Regulations

The proposed project is a water recharge project that would not result in the construction of facilities or developments that would generate solid waste. The proposed project may result in export of soil and other materials extracted to construct recharge basins and conveyance structures, and all work would be conducted in compliance with all federal, state, and local statutes and regulations related to solid waste and its disposal.

Impacts and Mitigation Measures

Threshold 4. Water Supplies

Impact UTIL-1: The proposed project could require new or expanded water supply resources or entitlements.

The proposed project does not require a new water supply. Water used for recharge as part of the proposed project would be conveyed to/from Stockdale East and Stockdale West via the CVC, Rosedale's West Intake Canal, and the proposed Central Intake Pipeline. In addition, other regional facilities may be used to move water to/from the project sites, such as the Pioneer Canal, subject to any available capacity and any necessary approvals. Once the third Stockdale project site is identified, conveyance options would be determined.

The source for recharge waters for the proposed project could potentially include federal, state, and local sources as described in **Chapter 2, Project Description**. Water sources could include, but are not limited to, the CVP, SWP, Metropolitan Water District of Southern California, and appropriative water rights including pre-1914 and post-1914 water rights, and other Kern River water depending on availability. Sources of water to serve as recharge waters would be available only during certain conditions and subject to the requirements of DWR, SWRCB and the water rights' holders. Agreements would be made, as necessary, in advance of any water exchanges or transfers.

Pre-1914 and post-1914 water rights can be transferred to other parties as long as legal users of water are not injured ("no injury rule," per Water Code Sections 1706 and 1702). The SWRCB supervises changes to post-1914 water rights, but not pre-1914 water rights. In addition, for transfers of post-1914 water rights, the SWRCB must make a finding that the transfer will not result in unreasonable effects on fish or wildlife or other in-stream beneficial uses (SWRCB, 1999). The "no unreasonable effect" test is not the same as the evaluation of significant impacts under CEQA (SWRCB, 1999). Should the use of such post-1914 appropriative water rights require evaluation of impacts to legal users and other environmental considerations, additional analysis may be required. Otherwise, given that transfers of appropriative water rights are subject to the approval of the transferring agency, and at times the SWRCB, and that the water code requires a finding of no injury, and at times a finding of no unreasonable effect, the uses of such waters for recharge would not result in significant impacts.

The unregulated high-flow Kern River water captured under the project for recharge would consist of water that would otherwise have left Kern County or created flooding conditions. Therefore, relative to baseline conditions, the use of unregulated high-flow Kern River water for recharge would not result in significant impacts to other legal users of water.

Impact Determination

The proposed project does not require a new water supply. No impacts to water rights holders, other water suppliers, or other public utilities would occur from the purchase, exchange, or transfer of water from the sources identified in Section 2.4.2 of Chapter 2. Should water from other sources not suggested in Section 2.4.2 of this EIR be acquired for recharge, additional analysis may be required subject to the discretion of Rosedale and IRWD. Impacts would be less than significant.

Significance Conclusion

Less than Significant.

Mitigation Measures

None required.

Threshold 6. Landfill Capacity

Impact UTIL-2: The proposed project could require additional landfill capacity.

As mentioned previously, recharge facilities on Stockdale West have already been constructed and minimal soil would be excavated onsite to construct proposed wells and the Stockdale West Turnout. Construction of the recharge and recovery facilities on Stockdale East and the Central Intake Pipeline, along with the pump station and CVC turnout, would generate excavated soils and construction debris. During formation of the recharge basins, excavated soils would be used to create the berms around the recharge basins, such that no landfill capacity would be needed for disposal of excess soils. Construction of recovery wells, the pumps station and turnout, and the Central Intake Pipeline would generate some excess excavated soils. Excess soils, non-hazardous construction refuse, and solid waste would be either collected and recycled or disposed at one of two local landfills, either Bena Landfill or Shafter-Wasco Landfill, approximately 20-25 miles from the project site. Both landfills have a capacity of 4,500 and 334 tons per day, respectively, which would allow sufficient room for construction and solid waste from Stockdale East and the Central Intake, and any potential solid waste generated at the third Stockdale project site. Any potentially contaminated soils at Stockdale East or the Central Intake alignment associated with neighboring oil extraction operations or historical agricultural pesticide or fertilizer use would be removed and disposed in accordance with all federal, state, and local hazardous materials regulations. See Chapter 3.8, Hazards and Hazardous Materials for more information. The proposed project would be required to comply with all federal, state, and local statutes and regulations related to solid waste.

Impact Determination

Construction of the proposed project is not expected to generate a substantial amount of waste that would exceed the capacity of local landfills. Operation of the proposed project would not generate any solid waste. The proposed project would not require the creation of additional landfill capacity; construction-related waste would be accommodated at the two existing local landfills. Impacts would be less than significant.

Significance Conclusion

Less than Significant.

Mitigation Measures

None required.

Thresholds 8 / 9. Energy Consumption

Impact UTIL-3: The proposed project could result in a substantial increase in energy consumption that could affect local and regional energy supplies.

Energy intensity (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). Once constructed, the proposed project would involve recharge of source waters and extraction of groundwater, and conveyance of water resources to/from the proposed project via local and regional canals, channels, and the California Aqueduct. The potential impact of this action is based on the amount of energy required to convey, recharge, and extract water.

The majority of operational activity associated with the proposed project would involve the passive, gravity driven movement of water through pipes and basins. During the recharge phase, electric pumps would be required to boost water to/from recharge basins; the pumps would be powered by the existing electrical grid served by PGE. Recovery operations would involve extraction of water at Stockdale East and Stockdale West through five proposed recovery wells. Recovery activities would also be powered by the existing electrical grid. The maximum amount of energy expended per AF of water (kwh/AF) at Stockdale East and Stockdale West is shown in **Table 3.14-1**. The location of the third Stockdale project site has yet to be determined along with its ultimate size; energy use at the third Stockdale project site would likely be at an energy intensity similar to Stockdale East and Stockdale West. It is anticipated that activities on the third Stockdale project site would also be powered by the existing electrical grid.

TABLE 3.14-1
ESTIMATED MAXIMUM OPERATIONAL ENERGY CONSUMPTION

	Annual Energy Consumption	Energy Intensity
Recharge Activities*		
Stockdale West (27,100 AF/year)	813,000 kwh/year	30 kwh/AF
Stockdale East (19,000 AF/year)	570,000 kwh/year	30 kwh/AF
Other Recharge via Central Intake (10,000 AF/year)	600,000 kwh/year	60 kwh/AF
Recovery Activities		
Stockdale West (11,250 AF/year)	Up to 3,375,000 to 6,187,500 kwh/year	300 to 550 kwh/AF
Stockdale East (7,500 AF/year)	Up to 2,250,000 to 4,125,000 kwh/year	300 to 550 kwh/AF

* Energy for recharge activities would be used primarily for pumps.

SOURCE: ESA, 2013; Thomas Harder, 2013 (Appendix E to this DEIR)

Typically, recharge activities and recovery activities would not occur simultaneously. In some years, neither recharge nor recovery would occur. Energy consumption thus would not necessarily be regular or sustained over time. 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). The energy intensity for the proposed project falls within this range, with energy intensities for recharge activities estimated at 30 to 60 kwh/AF and 300 to 550 kwh/AF for recovery activities. According to the CEC, the energy intensity of different groundwater sources varies, depending on both the depth at which groundwater resides and the

efficiency of the pumps and motors used to pump it. In addition, in the context of energy intensity and benefits to the state, the primary benefit of groundwater is the ability to offset the high energy intensity of SWP deliveries in summer and fall. Groundwater banking and conjunctive use projects promote such strategies by recharging imported water during wet periods for later extraction during dry periods, either summer/fall months or drought periods when surface supplies are low (CEC, 2005).

Impact Determination

Implementation of the proposed project at Stockdale East, Stockdale West, the Central Intake alignment, and at the third Stockdale project site would intermittently increase demands on local energy providers. The demands to the electrical grid would not be as constant as residential, commercial or industrial uses due to the irregular use of the recharge and recovery facilities. It is not anticipated that additional power generation facilities would be required to serve the proposed project, or that the demand would exceed capacity of energy providers. IRWD and Rosedale will be required to engage PGE though the normal processes of establishing services to ensure adequate power supplies are provided to the project sites. This process has already been initiated.

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 UTIL-1**. Such energy efficiency measures would reduce the overall power requirements associated with the proposed project. With implementation of Mitigation Measure UTIL-1, impacts to local and regional energy supplies would be considered less than significant.

Significance Conclusion

Less than Significant with Mitigation.

Mitigation Measures

UTIL-1: IRWD and Rosedale shall install energy efficient equipment, including pumps and motors, for operation of the proposed project.

References – Utilities and Energy

California Energy Commission, 2005. *California's Water-Energy Relationship*. Prepared in support of the 2005 Integrated Energy Policy Report Proceeding (04-IEPR-01E). Final Staff Report, CEC -700-2005-011-SF, November 2005.

California Energy Commission, 2007. California Electric Utility Service Areas. Accessed http://www.energy.ca.gov/2007_energypolicy/documents/2007-05-15_workshop/presentations/Electric%20Utility%20Service%20Areas%205-10-07.pdf, December 23, 2013.

City of Bakersfield and Kern County, 2002. *Metropolitan Bakersfield General Plan Update EIR*, adopted June 26, 2002.

Personal communication, 2013. Gabrielle Kidwell, Engineer, Kern County Waste Management. December 23, 2013.

RAM, 2009. *Phase I Environmental Site Assessment for the Rosedale Rio-Bravo Storage District*. January 2010.

State Water Resources Control Board (SWRCB), 1999. *A Guide to Water Transfers*. Preapred by SWRCB Division of Water Rights, July 1999.

U.S. Energy Information Administration, 2013. Frequently asked questions: How much electricity does an American home use? Accessed at http://www.eia.gov/tools/faqs/faq.cfm?id=97&t=3, December 23, 2013.

CHAPTER 4
Cumulative Impacts

4.1 Introduction

CEQA Analysis Requirements

CEQA requires that an EIR assess the cumulative impacts of a project with respect to past, current, and probable future projects within the region. *CEQA Guidelines,* Section 15355, define cumulative effects as "two or more individual effects that, when considered together, are considerable or which compound or increase other environmental impacts." Pertinent guidance for cumulative impact analysis is given in Section 15130 of the *CEQA Guidelines*:

- An EIR shall discuss cumulative impacts of a project when the project's incremental effect is "cumulatively considerable", (i.e., the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of current projects, and the effects of probable future projects, (including those outside the control of the agency, if necessary).
- An EIR should not discuss impacts that do not result in part from the project evaluated in the EIR.
- A project's contribution is less than cumulatively considerable, and thus not significant, if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact.
- The discussion of impact severity and likelihood of occurrence need not be as detailed as for effects attributable to the project alone.

The analysis of cumulative effects in this chapter focuses on the effects of concurrent construction and operation of the proposed project with other spatially and temporally proximate projects as described below. As such, this cumulative analysis relies on a list of related projects that have the potential to contribute to cumulative impacts in the project area.

4.2 Related Projects

4.2.1 Geographic Scope

Cumulative impacts are assessed for related projects within a similar geographic area. This geographic area may vary depending upon the issue area discussed and the geographic extent of the potential impact. For example the geographic area associated with construction noise impacts is limited to areas directly adjacent to construction sites, whereas the geographic area that is

affected by construction-related air emissions may include the larger airshed. Construction impacts associated with increased noise, dust, erosion, and access limitations tend to be localized and could be exacerbated if other development or improvement projects are occurring within the same or adjacent locations as the proposed project.

The Stockdale Properties are located in western Kern County, approximately six miles west of the City of Bakersfield, 10 miles southwest of the Friant-Kern Canal, 2.50 miles south of the City of Shafter, and six miles east of the California Aqueduct. The site radius for the third property partially encompasses the western edge of the City of Bakersfield. Combined, Stockdale East and West are approximately 553 acres. The third project site has yet to be identified; however it would likely be up to 640 acres and characterized by agricultural land. For the purposes of this analysis, we considered related projects within a five-mile radius around the project sites when evaluating potential cumulative impacts due to construction of the proposed project. These related projects are listed in **Table 4-1**. To determine potential cumulative impacts due to operation of the proposed project, we considered existing and future water banking programs for the water districts in the Kern Fan area (**Figure 4-1**). These projects are listed in **Table 4-2**. Given this, the geographic scope for each issue area also may vary depending on the nature of the cumulative impacts.

4.2.2 Project Timing

In addition to the geographic scope, cumulative impacts also take into consideration the timing of related projects relative to the proposed project. The implementation schedule is particularly important for construction-related impacts; for a group of projects to generate cumulative construction impacts, they must be temporally as well as spatially proximate. The related projects described below may or may not occur simultaneously with the proposed project. However, this analysis assumes these projects would be implemented concurrently with construction of the proposed project, beginning in summer 2015 and commencing operations three years later.

4.2.3 Type of Projects Considered

As described in Chapter 3 of this EIR, the impacts associated with implementation of the proposed project include both short-term, temporary construction-related impacts and long-term impacts related to project operation. Therefore, cumulative effects could result when considering the effects of the proposed project in combination with the effects of other construction projects in the area and the effects of operating other water banking projects in Kern Fan area. For this analysis, other past, present, and reasonably-foreseeable future construction projects, particularly other capital improvement and development projects, in the area have been identified (Table 4-1). In addition, other past, present, and reasonably-foreseeable future water banking projects in the Kern Fan area have been identified (Table 4-2).

SOURCE: ESRI 2013, California Department of Water Resources

Stockdale Integrated Banking Project . 211181

Figure 4-1

Kern County Water Districts

This page intentionally left blank

TABLE 4-1
CAPITAL IMPROVEMENT AND DEVELOPMENT PROJECTS

Project	Project Type	Location/Area Affected
Caltrans District 6 Projects (1)		
Rosedale Highway Widening	Roadway Widening	Rosedale Highway between Allen Road and Gibson Street, add two lanes
State Route 99 Auxiliary Land/Rosedale Highway Off-ramp Improvements	Roadway Improvements	State Route 99 and Rosedale Highway off-ramp, operational and safety improvements
24th Street Improvements	Roadway Improvements	24th Street from SR99 to M Street; widen, realign, and restripe
State Route 99/Hosking Avenue Interchange	New Interchange	State Route 99 in South Bakersfield at Hosking Avenue
State Route 58 Gap Closure	Roadway Widening	Widen SR 58 between SR 99 and Cottonwood Road, Bakersfield
State Route 178 at Morning Drive Interchange	Roadway Improvements	New interchange at SR 178; widening of SR 178 from two to four lanes
State Route 99 Widening Project, North Bakersfield	Roadway Widening	State Route 99 between SR204 to Beardsley Canal Undercrossing
State Route 99 Widening Project, South Bakersfield	Roadway Widening	State Route 99 between SR119 to Wilson Road Overcrossing
Centennial Corridor Project	Road Improvement	Interstate 5 to State Route 58 East through Bakersfield; State Route 99 from Wilson Road (south) to Gilmore Avenue (north)
City of Bakersfield (2)		
GP Amendment/ZC No. 13-0125; Construction of 167 MF units	Residential	Taft Highway and Wible Road
Zone Change 12-0416; Construction of 50 MF units; 60,000 sf office and commercial use	Residential/Commercial	Baker and Kentucky Street
Conditional Use Permit 12-0436; 7.5 acre drill state to accommodate two new oil wells	Oil Well Drill Site	13755 White Lane, Bakersfield
GP Amendment/ ZC 12-0349; Construction of maximum 617 MF dwelling units	Residential	Panama Lane & Stine Road
Kern River Channel Maintenance Program	Flood Plain Management	Kern River Channel/Stockdale Highway
General Plan Amendment/Zone Change No. 12-0355/PD Review No. 12-0356; 252,497 sf mini storage facility	Commercial Development	China Grade Loop and Manor Street
General Plan Amendment/ Zone Change 12-0372	Residential Development	Rosedale Highway and Van Buren Place
Conditional Use Permit No. 12-0323	Oil Well Drill Site	4900 S. Allen Road
Kern River Flow and Municipal Water Program	Water Flow Management	Kern River
24th Street Cul-de-sacs	Road Improvement	24th Street and Elm

Project	Project Type	Location/Area Affected
Kern County (3)		
Zone Change 15, Map 140; PD Plan 5, Map 140; Exclusion from Ag Preserve 10; Tentative Parcel Map 11235 – Oil Field-related Warehouses	Oil Well Drill Site	Enos Lane and Taft Highway (SR 119)
Central Valley Investors; construction of 39,685 sf of commercial space	Commercial	SE corner of Olive Drive and Victor Street
Old River Solar Project	Solar Development	Shafter Road, between Godsford Rd and Ashe Rd
Rosedale & Renfro Precise Development Plan; 229,000 sf shopping center	Commercial Development	NE corner of Renfro Rd and Rosedale Hwy
Renfro Rd-Johnson Rd to Rosedale Highway	Pave Shoulders	Renfro Road and Johnson Road
Heath Rd.-Johnson Rd to Rosedale Highway	Pave Shoulders	Heath Road and Johnson Road

SOURCES: (1) Caltrans District 6, 2015; TRIP, 2015; (2) California OPR, CEQAnet database, 2015; (3) Kern County Planning and Community Development, Environmental Documents 2015; Kern County Construction Projects, 2015.

TABLE 4-2
GROUNDWATER BANKING PROGRAMS IN KERN COUNTY

Project	Type	Gross Area of District (Acres)
Semitropic WSD	In Lieu/Direct Recharge Projects	221,000
Arvin Edison WSD	In Lieu/Direct Recharge Projects	130,000
Rosedale Rio Bravo WSD	In Lieu/Direct Recharge Projects	44,000
Buena Vista WSD	In Lieu/Direct Recharge Projects	50,000
Kern Delta WD	In Lieu/Direct Recharge Projects	125,000
Cawelo WD	In Lieu/Direct Recharge Projects	45,000
Berrenda Mesa WD	Direct Recharge Projects	369
City of Bakersfield, 2800 Acres	Direct Recharge Projects	2,760
Kern County Water Agency Pioneer Project	Direct Recharge Projects	2,250
Kern Water Bank	Direct Recharge Projects	20,500
West Kern WD/Buena Vista WSD	Direct Recharge Projects	2,000
North Kern Water Storage District	Direct Recharge Projects	75,000

SOURCES: Kern County Water Agency, Buena Vista Water Storage District, Rosedale Rio Bravo Water Storage District, Kern Delta Water District.

In addition to the related projects listed in Tables 4-1 and 4-2, additional development that has not yet been identified, could occur within the project area and may contribute to cumulative impacts. In addition, each of the implementing agencies is planning numerous small-scale projects that

have not been included in the list. This analysis assumes that in the vicinity of the proposed project, there will be on-going construction projects throughout the implementation period.

4.2.4 Description of Select Related Water Banking and Infrastructure Projects

Kern Water Bank Authority

The Kern Water Bank is directly adjacent to the southern boundaries of Stockdale East and Stockdale West. The Kern Water Bank Authority (KWBA) was formed in 1996 as a joint powers authority and operates on approximately 20,500 acres in Kern County. The main purpose of the Kern Water Bank is to recharge, store, and recover water to improve water supply for KWBA members. The Kern Water Bank is located on the Kern River alluvial fan and receives water from three sources: the Kern River, the California Aqueduct, and the Friant-Kern Canal. Through May 2011, the Kern Water Bank project has recharged over 1.7 million acre-feet and recovered nearly 0.9 million acre-feet leaving a current balance of about 0.8 million acre-feet in storage (KWBA, 2012, 2015).

The Final EIR that was prepared to support the formation of the Kern Water Bank was recently successfully challenged (*Rosedale-Rio Bravo Water Storage District, et al. vs. Department of Water Resources, et al.* (Sacramento County Superior Court Case No. 34-2010-80000703)), and the California Department of Water Resources (DWR) is currently preparing new CEQA documentation. In the meantime, the Kern Water Bank project is currently continuing to operate pursuant to the Interim Operations Plan (see Chapter 1). For purposes of analyzing cumulative impacts for the proposed Stockdale Integrated Banking Project, it is assumed that the Kern Water Bank project will continue to operate in the foreseeable future in a manner similar to historic practices.

In addition to the existing Kern Water Banking project, the KWBA is proposing the Conservation and Storage Project, which would involve the appropriation of up to 500,000 AFY of unappropriated water from the Kern River. In February 2010, the SWRCB issued an order removing fully-appropriated status from the Kern River, although this determination is currently being appealed. Nonetheless, KWBA has filed a water right application for the appropriation to support the Project. As part of the Project, the KWBA intends to divert water from the Kern River for storage in the Kern Water Bank for later recovery and delivery in dry years. The KWBA issued the NOP for this project in February 2012.

Drought Relief Project

The Drought Relief Project (DRP) includes construction and operation of nine groundwater production wells within Rosedale's service area to recover water stored in Rosedale's Conjunctive Use Program. The DRP includes six wells on Rosedale's Superior Basins and three wells on Rosedale's West Ponds, as shown in Figure 1-2. Three of the wells on the Superior Basins will represent the offsite well component of the Strand Ranch Project, and another three wells will be used by CLWA as part of its participation in Rosedale's Conjunctive Use Program. It is estimated that each DRP well would have a recovery rate of approximately 3,000 gpm, based

on typical well production rates in the area, and may be screened in both the intermediate and deep aquifers (250 to 700 feet bgs). The construction and operation of the wells have been previously evaluated pursuant to CEQA (Rosedale, 2001; Rosedale, 2003; Rosedale, 2008; CLWA, 2014). A drawdown analysis has been conducted to evaluate the collective operation of all DRP wells and their combined effects on groundwater levels (THC, 2014). The drawdown analysis also considers simultaneous operation of DRP wells together with the proposed wells on Stockdale East and Stockdale West and the Strand Ranch Project wells.

James Groundwater Storage and Recovery Project

The James Groundwater Storage and Recovery Project is a proposed 700 acre project in southwest Bakersfield designed to recharge, store and recover water to provide a cost-effective and reliable water supply for landowners within Rosedale. The James Project is approximately three miles southeast of Stockdale East, south of the Kern River and bordered to the south by Panama Lane. The project water would help provide an affordable and reliable water supply to approximately 25,000 acres of irrigated agriculture and over 10,000 residents within Rosedale and 50,000 acres in Buena Vista Water Storage District. The project property, known locally as McAllister Ranch, was formerly a planned residential development that was in the early stages of construction. Due to the downturn in the real estate market and project financing issues, development was discontinued and the property sat idle for several years until it was sold in a bankruptcy proceeding. Rosedale and Buena Vista Water Storage District jointly purchased the property in 2011. A Notice of Preparation of an Environmental Impact Report was published in May 2012.

Water is a critical resource and Kern County, like many other areas of the state, is continually challenged with procuring a clean, reliable water supply in sufficient quantity to provide for our residential, agricultural and municipal water needs. This project has the potential to recharge up to 57,600 acre feet of water in wet years and recover 40,000 AFY during times of need.

2800 Acres Project and Pioneer Project

The City of Bakersfield operates the “2800 Acres” water banking project and the Kern County Water Agency operates the Pioneer Groundwater Recharge and Recovery Project (Pioneer Project). Both projects are groundwater banking projects along the Kern River and also adjacent to the boundary with Rosedale. Water sources include the Kern River, SWP, and CVP. Rosedale is a participant in the Pioneer Project, along with other regional water districts.

City of Bakersfield Kern River Flow and Municipal Water Program

The City’s Kern River Flow and Municipal Water Program (KRFMWP) is listed above in Table 4-1. The City is proposing to enhance the Bakersfield water supply by allocating a portion of its existing pre-1914 appropriative rights to the Kern River, and also directing unappropriated surplus Kern River water (under application with the State Water Resources Control Board) to flow in the Kern River channel as available, for purposes of groundwater recharge among other

things.[1] Other water agencies have also applied to the SWRCB for unappropriated Kern River water. In 1989, the SWRCB declared that the Kern River, from the Buena Vista Lake bed upstream (including all tributaries) was fully appropriated year-round. The "fully appropriated" status of the Kern River meant that the SWRCB would not accept new applications for diversion from the Kern River unless it could be demonstrated that unappropriated water exists. Recent court decisions finding a partial forfeiture of certain Kern River water rights has given rise to several petitions questioning the fully-appropriated status of the Kern River. The entities filing petitions include Rosedale, KCWA, KWBA, Buena Vista Water Storage District, the City of Bakersfield, and North Kern Water Storage District/City of Shafter.

Along with the petitions to reassess the Kern River's fully-appropriated status, these entities have filed applications to appropriate water from the Kern River should it be determined that unappropriated water exists. The full allocation of Kern River water may be determined by the SWRCB and additional local water diverters may be identified. The outcome of the SWRCB proceedings is highly speculative at this time.

With respect to the proposed project, the KRFMWP would similarly be a groundwater recharge and recovery project. The proposed project would not have environmental effects that would combine with the City's proposed use of unappropriated water.

Centennial Corridor Project

The California Department of Transportation (Caltrans), in cooperation with the City of Bakersfield and Kern County, is in the process of constructing a new alignment for State Route (SR) 58. It will provide a continuous route from Interstate 5 to the west to Cottonwood Road on existing SR 58 east. Construction of the Centennial Corridor will be completed in segments. Segment 2, composed of the Westside Parkway, is mainly complete and open to the public, save from Phase 6C, the westernmost portion from Allen Road to Stockdale Highway, which is currently under construction (Bakersfield Freeways, 2015).

According to the Centennial Corridor Draft Environmental Impact Report (Caltrans, 2014), Segment 3 of the Project will include the re-designation of Stockdale Highway to SR 58 to provide access to Interstate 5 from Bakersfield. Stockdale Highway runs along the northern border of Stockdale East and Stockdale West and crosses the proposed Central Intake alignment. Improvements to the intersection of State Route 43, running north to south, and Stockdale Highway, running east to west, will be required to ensure proper flow of traffic. This intersection is located on the northwestern corner of Stockdale East, with SR 43 running in between Stockdale East and Stand Ranch. Improvements will include a widening of the intersection and installation of traffic signals. Caltrans will also widen both SR 43 and Stockdale Highway to add dedicated left-turn lanes, and a shared through/right-turn lane in both directions on Stockdale Highway,

[1] The Tulare County Superior Court determined, in a Tentative Decision issued March 12, 2015, that the City's certification of the EIR for the project shall be set aside. (*North Kern Water Storage District, et al. vs. City of Bakersfield* (VCU251748 and related cases). The Court has not entered a final judgment. As such, the status of the City's proposed project is uncertain.

which will require Kern County to acquire a small amount of right-of-way on either side of the highway (Caltrans, 2014).

4.3 Impacts and Mitigation Measures

Project Construction

Impact CUM-1: Concurrent construction of several projects in the vicinity of the Stockdale Properties could result in cumulative short-term impacts associated with air quality, biological resources, cultural resources, noise, traffic, and water quality.

Air Quality and Greenhouse Gas Emissions

As already explained in **Chapter 3.3 Air Quality**, according to the SJVAPCD, any project that would individually have a significant air quality impact could also be considered to have a significant cumulative air quality impact. Construction emissions from the project would result in the generation of air pollutants in the San Joaquin Valley Air Basin and in the immediate vicinity of the project area, and would incrementally add to cumulative emissions. The project would also add to ozone precursor emissions on a regional basis and would incrementally add to PM10 and CO emissions on a local basis. For operation activities, on-road traffic would be minimal and would result in a negligible increase in criteria pollutant emissions. Triennial earthwork operations would also result in minor increases in criteria pollutant emissions. Short-term project construction and long-term project operations would result in a less-than-significant individual project impact. Therefore, the proposed project would not result in cumulatively considerable increases of criteria air pollutants.

As already explained in **Chapter 3.7 Greenhouse Gas Emissions**, the analysis of impacts to GHG emissions is inherently cumulative. Impacts associated with GHG emissions have been determined to be less than significant. No additional analysis is required.

Biological Resources

Construction of facilities in and around open space areas could result in destruction and/or disturbance of natural habitat. Habitat destruction/disturbance would contribute to the overall impacts to natural habitat in the vicinity of proposed project resulting from cumulative development. The proposed project area is characterized primarily by agricultural land use; no designated open space areas would be disturbed as a result of the proposed project.

Construction of the proposed project at the Stockdale Properties and Central Intake could result in impacts to special-status species and migratory birds. Implementation of **Mitigation Measures BIO-1** through **BIO-6** would reduce potential impacts to special-status species and migratory birds to less than significant levels. No impacts would occur on the Stockdale East and Stockdale West properties regarding jurisdictional wetlands. However, depending on the location of the third Stockdale project site, and the jurisdictional determination regarding Goose Lake Slough and level of disturbance related to the Central Intake inlet/outlet, impacts could occur. Implementation of **Mitigation Measure BIO-7** would reduce any impacts to wetlands or jurisdictional resources to a less than significant level.

The projects listed in Tables 4-1 and 4-2 could involve permanent loss of habitat and contribute to cumulative impacts to special-status species and migratory birds in the project area. Implementation of the proposed project would have potentially significant impacts to biological resources that could incrementally contribute to cumulative effects when considered together with other related project. However, the proposed project would not result in the permanent loss of habitat for any special-status species, and Mitigation Measures BIO-1 through BIO-7 have been identified to fully mitigate any potential impacts to species or wetlands. Therefore, the proposed project would not contribute significantly to cumulative loss of species or habitat in the project vicinity.

Cultural Resources

The geographic scope for cumulative impacts to archaeological and paleontological resources includes a one-mile radius from the project site. This geographic scope of analysis is appropriate because the archaeological, historical, and paleontological resources within this radius are expected to be similar to those that occur on the project sites because of their proximity; similar environments, landforms, and hydrology would result in similar land-use—and thus, site types. Similar geology within this vicinity would likely yield fossils of similar sensitivity and quantity.

The project vicinity contains a significant archaeological and historical record that, in many cases, has not been well documented or recorded. Thus, there is potential for ongoing and future development projects in the vicinity to disturb landscapes that may contain known or unknown cultural resources. Potential impacts of the proposed project to cultural resources, in combination with other projects in the area, could contribute to a cumulatively significant impact due to the overall loss of historical and archaeological artifacts unique to the region. However, this analysis includes mitigation measures in the event that archaeological resources are encountered during construction activity, which would reduce project impacts to a less than significant level. Therefore, with implementation of **Mitigation Measures CUL-1** and **CUL-2**, the proposed project would not have a cumulatively considerable contribution to impacts to archaeological and historical resources.

Excavation activities associated with the proposed project in conjunction with other projects in the area could contribute to the progressive loss of fossil remains, as-yet unrecorded fossil sites, associated geological and geographic data, and fossil bearing strata. However, in the event that paleontological resources are encountered, the proposed project would have less than significant impacts by requiring implementation of **Mitigation Measures CUL-3** and **CUL-4**. Therefore, with the implementation of Mitigation Measures CUL-3 and CUL-4, cumulative impacts to paleontological resources would be less than significant. Furthermore, through the implementation of **Mitigation Measure CUL-5** would mitigate the project's potential to disturb any human remains, including those interred outside of formal cemeteries, and cumulative impacts to human remains would be less than significant. Consequently, the incremental effects of the proposed project, after mitigation, would not contribute to an adverse cumulative impact on cultural or paleontological resources or human remains.

Noise

The primary sources of noise in rural agricultural areas such as the project sites are roadway traffic and farm machinery on a seasonal basis. Construction of the proposed project would generate some noises that are different from typical background noise in the project area. Related projects in the surrounding area would also temporarily generate noise associated with construction activities, in particular construction of Segment 3 of the Centennial Corridor Project, which would widen Stockdale Highway along the northern border of Stockdale East and Stockdale West. The neighboring Kern Water Bank Conservation and Storage Project would utilize existing facilities at the existing Kern Water Bank project and would not require any new construction.

If construction of the proposed project were to occur coincidentally with Segment 3 of the Centennial Corridor Project, sensitive receptors in the immediate vicinity could experience cumulatively considerable noise impacts. For the proposed project, to mitigate for temporary increases in ambient noise levels associated with construction activity, **Mitigation Measure NOISE-1** would require the construction contractor to locate equipment directed away from sensitive receptors and maintain noise controls on standard construction equipment. In addition, implementation of **Mitigation Measure CUM-1** would require the construction contractor to consult with Caltrans District #6 to coordinate construction schedules, if necessary, to minimize potential compounding of effects to ambient noise levels due to construction activities associated with both projects. With implementation of mitigation, the incremental impact of project construction activities to increases in ambient noise levels would not be cumulatively considerable.

Traffic

Concurrent construction of the proposed project with other related projects would temporarily increase traffic due to increases in vehicle trips by construction workers and construction vehicles on area roadways, increase potential traffic safety hazards on public roadways, and damage road pavement. As described in **Chapter 3.13, Transportation and Traffic**, the number of vehicles added to local roadways due to construction and operation of the proposed project is relatively small relative to current AADT and would not affect performance standards for roadway circulation. Construction of the Central Intake across Brimhall Road may cause temporary lane or road closures, but implementation of a Construction Traffic Control Plan (**Mitigation Measures TR-1** and **TR-2**) would ensure effects to traffic flow are minimized. Construction of the Central Intake across Stockdale Highway would be accomplished using jack-and-bore methods or a similar tunneling technique that would avoid disruption to the roadway. As such, the proposed project together with the Centennial Corridor Project would not combine to create cumulative impacts to traffic flow or circulation. However, given that the Centennial Corridor Project would widen Stockdale Highway, the construction zones of both projects could overlap. Implementation of **Mitigation Measure CUM-1** would ensure the construction contractor consults with Caltrans prior to initiating construction of the Central Intake Pipeline to discuss construction schedules, project plans, and staging plans, to ensure construction activities associated with both projects would be located to avoid conflict or incompatibility of equipment or construction methods.

The increase in operational vehicles due to project maintenance would not be substantial enough to affect local roadway LOS or cause LOS to drop below LOS standards (LOS D). Thus, it is unlikely that the proposed project, together with related projects, would contribute enough vehicles to affect LOS on roadways in the project vicinity. In addition, if necessary, related projects would incorporate project-specific mitigation measures to reduce their respective impacts related to construction traffic, including the preparation and implementation of traffic control plans. Therefore, the proposed project's incremental contribution to traffic-related congestion would not be cumulatively considerable.

Water Quality

Concurrent construction of the proposed project with other related projects in the Kern Fan region could result in temporary impacts to hydrology and water quality in the project area. Concurrent construction activities could result in increased erosion and subsequent sedimentation, with impacts to water quality in downstream water bodies and/or storm drain capacity. Additionally, surface water quality could be affected by construction activities that result in the release of fuels or other hazardous materials to stream channels or storm drains, or discharge from excavation dewatering activities. The Kern River is not listed as an impaired water body in the Basin Plan. Implementation of SWPPPs for the proposed project and other related projects greater than one acre would minimize the potential for impacting water quality in compliance with the General Construction Permit discharge conditions (see **Chapter 3.9**, **Hydrology**). In particular, the BMPs required in **Mitigation Measure HYDRO-1** would be included in the SWPPP for the proposed project to ensure potential impacts related to erosion and storm water quality are reduced to less-than-significant levels. Therefore, the proposed project's incremental contribution to construction-related water quality impacts would not be cumulatively considerable.

Significance Conclusion

Less than Significant with Mitigation.

Mitigation Measures

CUM-1: The construction contractor shall consult with appropriate local agencies and jurisdictions prior to initiating ground-disturbing activities, to determine if other construction projects will occur coincidentally at the same time and in the vicinity of the proposed project, depending on project schedule. Coordination of construction activities for coincident projects shall occur to ensure impacts to noise and traffic do not compound to be cumulatively significant and to ensure compatibility of activities within construction zones. Adjustments to construction schedules and plans shall be made accordingly as necessary.

Project Operation

Impact CUM-2: The proposed project and related projects could result in cumulative long-term impacts to groundwater resources.

Kern County has a long history of reliance on groundwater resources as a source of water supply for agriculture, drinking water, and industrial uses. The combination of very thick, coarse-grained

sediments of the Kern Fan and recharge from the Kern River has created a very large groundwater resource. However, uncontrolled groundwater pumping beginning in the 1920s eventually caused great declines in groundwater levels and subsequent land subsidence in the region. Although Bakersfield has not experienced as much subsidence as elsewhere in the San Joaquin Valley, the underlying groundwater resources have nonetheless been threatened by declining water levels. With the advent of improved groundwater management practices including groundwater banking and groundwater recharge projects, the groundwater basins have begun to recover.

Groundwater banking programs are typically designed to hydraulically transfer surface waters into the available storage capacity of the underlying aquifer. Years of high precipitation/snow pack (e.g., 2007) provide opportunities to divert high flows from the Kern River into recharge facilities for future use thereby bolstering available groundwater supplies. The groundwater banking programs of Kern County represent the largest operations of this kind in the United States. The various entities or water districts that operate water banking programs in the Kern Fan area include Rosedale, KWBA, Kern Delta Water District, Buena Vista Water Storage District, Henry Miller Water District, Berrenda Mesa, the City of Bakersfield's 2800 Acres Project, and the Pioneer Project (Figure 4-1). Other districts outside the fan include Semitropic Water Storage District, North Kern Water Storage District, West Kern Water District, Improvement District No. 4, Rosedale Ranch ID, Cawelo Water District, and Arvin-Edison Water Storage District; although, not all of these entities are actively involved in groundwater banking operations. However, many of these districts are either currently developing groundwater banking projects or have plans to expand operations in the future, such as KWBA's Conservation and Storage Project and the City of Bakersfield's KRFMWP.

Groundwater banking projects are designed to maintain a positive project balance such that no net water would be removed from the basin. The projects operate by recharging water in wet years and recovering water in dry years. Water banks only recover water up to the amount previously banked minus an amount to account for losses to the basin.

Long term trends have shown improvements in groundwater levels, when compared to a no-project condition; however even with the overall benefits seen with groundwater banking programs, temporary effects can be experienced during years or multiple years when recovery of stored water occurs. For example, 2001 was a year where recovery operations far exceeded recharge operations. As a result, drawdowns in monitoring wells during 2001 were observed to be as much as 165 feet. In addition, as described in Chapter 3.9, recovery activities resulted in a groundwater fluctuation of 246 feet from an historical high level in 2007 to an historical low level in 2010 (THC, 2015). However, groundwater levels subsequently rebounded to within about 40 feet of historical high levels by 2012 as recharge activities resumed and dominated the effects of recovery. Preliminary information for groundwater elevations from 2014 indicates that previous historic low groundwater levels may have been met or exceeded, given the current and ongoing drought conditions (Kern Fan Monitoring Committee, 2015).

Many of the Kern Fan groundwater banking projects operate under Memoranda of Understanding (MOUs) which were developed as an effort to protect the underlying groundwater resources and

avoid adverse effects. Under the MOUs, groundwater banking operations should be "consistent with avoiding, mitigating or eliminating to the greatest extent practicable, significant adverse impacts." For the proposed project, the Long Term Operations Plan (see Appendix B) implements the provisions of the MOUs by providing a framework under which Rosedale would monitor for and identify project-related adverse impacts to neighboring entities. The Long Term Operations Plan designates specific measures to be employed to "prevent, eliminate or mitigate significant adverse impacts" resulting from project operation, including effects to neighboring wells. Projects operated pursuant to current MOUs are designed to recover only the amounts that have been stored through recharge activities minus the accounting of factored losses. These assumed losses are not recoverable by any of the water districts and become additions to the aquifer. The losses are derived from surface recharge loss, water recharged and subsequently extracted for out-of-district use, water banked by out-of-County entities, and water banked if purchased by adjoining entities within 3 years.

As described in Chapter 3.9, Hydrology and Water Quality, modeling for the proposed project included a drawdown analysis that included surrounding areas and neighboring wells (see Appendix E). Different recharge and recovery scenarios were evaluated to assess potential cumulative groundwater level changes that could be expected under the various hydrological conditions that were observed over the period of 2004 to 2010. This time period included low groundwater conditions (February 2004 through November 2004), historical low groundwater conditions (September 2009 through June 2010) and historical high groundwater conditions (January 2005 through January 2006). Potential groundwater level changes due to project operation would be greatest at the project sites; would be temporary in nature, and would decrease with distance from the project site (THC, 2015). The results of the impact analysis in Chapter 3.9 concludes that project operations are not expected to significantly affect operation of neighboring wells because the modeled drawdown associated with pumping at Stockdale East and Stockdale West would not result in groundwater levels below typical well depths. Modeling of the proposed groundwater extraction indicates that once project pumping ceases, groundwater levels would recover to within five to eight feet of the pre-pumping groundwater level after three to six months, even during conditions that represent historical low conditions (THC, 2015). In addition, the modeling for the proposed project analyzed regional groundwater flow gradients, and the results show no substantive changes as a result of recharge or recovery operations (THC, 2015).

Although operation of the proposed project alone would not affect groundwater levels to a degree that would result in neighboring well being unable to support existing or planned land uses, when considered together with existing and future groundwater banking projects in the Kern Fan region, there is potential for the project's incremental effects to be considerable when combined with the effects of other banking projects. Significant cumulative impacts to groundwater due to concurrent operation of regional groundwater banking projects could occur, particularly during extreme conditions. For example, concurrent operation of the proposed project together with the Drought Relief Project (DRP) would result in simultaneous operation of 14 recovery wells located on Stockdale East, Stockdale West, Superior Basins, and West Ponds. The effects of such recovery operations would serve to temporarily lower groundwater levels beneath and around these wells. The effects of combined operations have been modeled using a similar methodology,

and the same regional groundwater flow model, as the analysis conducted for the proposed project. The cumulative analysis assumes that all 14 recovery wells are operating for eight months and approximately 44,100 AF of groundwater is extracted (THC, 2014). The analysis also incorporates groundwater pumping and recharge for all other existing banking projects and pumpers in the modeled area, including the Strand Ranch Project. The analysis also evaluates differential effects of perforating the DRP wells in either the intermediate and deep aquifers or just the deep aquifer alone.

The results of the cumulative analysis suggest that the effects of combined recovery operations would slightly increase drawdown at the closest private landowner wells north of Stockdale East and Stockdale West. Expected drawdown in the intermediate aquifer would range between 20 to 30 feet, which indicates a potential increase from the estimated project-related drawdown of 21 feet due to operation of just the Stockdale East and West wells (THC, 2014). At the nearest production well (KWB well 6D03), expected drawdown in the deep aquifer would range between 30 to 60 feet, depending on whether the DRP wells are perforated in the deep and/or intermediate aquifers (THC, 2014). This would represent a potential increase from the estimated project-related drawdown of 29 feet due to operation of just the Stockdale East and West wells.

Given the depths of the neighboring private and production wells, the modeled cumulative drawdown would not lower groundwater to a level that would affect neighboring well operation. Considering historic low groundwater levels, additional drawdown of 30 feet would lower groundwater to 270 feet bgs in the intermediate aquifer in project vicinity. Given that private wells are generally 300 to 400 feet deep, there would be sufficient exposed screen, even with the cumulative drawdown, to provide adequate flow to support operation at low production rates and to support overlying land uses. In the deep aquifer, additional drawdown of 60 feet would lower groundwater to 339 feet bgs in the project vicinity under historic low groundwater conditions. This groundwater level is still higher than the typical production well depth of 700 feet bgs, including the KWB well 6D03, which is 704 feet deep. Therefore, the cumulative impacts of operating wells associated with the proposed project, DRP, and other existing banking projects such as Strand Ranch would not have cumulatively considerable impacts to neighboring well operations.

However, historical low groundwater levels may have recently been exceeded in 2014 due to ongoing drought conditions (Kern Fan Monitoring Committee, 2015), and other future groundwater banking projects may be developed that increase cumulative recovery capacity in the project area. Therefore, implementation of Rosedale's Long Term Operations Plan, as required by **Mitigation Measure CUM-2**, would serve to mitigate the proposed project's incremental contribution to cumulative groundwater impacts and associated effects to wells serving overlying land uses. A general description of the primary components of the Long Term Operations Plan is as follows:

A. Establish a Protocol for Monitoring and Reporting Groundwater Conditions:

- Rosedale will conduct monitoring of groundwater conditions during years that recovery is expected from a Rosedale project, in addition to the monitoring conducted by the Kern

Fan Monitoring Committee. Rosedale will report current groundwater levels monthly to its Board of Directors and make reports available to the public on its website.

- Rosedale will regularly update its Groundwater Model to actual conditions; use the Model to predict future groundwater conditions; report modeling results to its Board of Directors; and make modeling results available to the public on its web site.
- Recovery in any calendar year shall not commence until the Model has been run for projected operations.

B. Implement Proactive Measures

- Rosedale's Groundwater Model will be used to predict the contribution of Rosedale's projects to groundwater level declines in the area. The Model will be used to simulate and compare the No-Project Condition to the Project Condition. The No-Project Condition is the water level that would have been at any particular well location absent the Rosedale project.
- The Model will be periodically run and updated as recovery plans become known or change in any given year.
- The Model will be used to identify a negative project impact (NPI) based on the comparison of No-Project Conditions and Project Conditions, and to identify the wells at risk of impact during recovery operations.

C. Establish Triggers and Mitigation Actions

- Mitigation measures will be implemented when a NPI is triggered in years when average water levels at specified wells[2] are more than 140 feet from the surface as measured on March 31 each year. It is expected that water levels will not decline to an extent resulting in a NPI when water levels are less than 140 feet from the surface.
- A NPI is triggered when the Model results predict that groundwater levels under Project Conditions are 30 feet deeper than No-Project Conditions at a nearby existing and operative well, and the well has (or is expected to) experience mechanical failure or other operational problems due to declining water levels. Given historical fluctuations in groundwater levels in the area when other nearby groundwater banking projects are recovering, it is expected that additional declines attributable to the proposed project beyond historic low groundwater levels could result in operational problems at some existing wells.
- Agricultural Wells. The following measures would be implemented when a NPI is triggered for an operational agricultural well:
    - When the Model predicts a NPI outside the current operating range of the pump but within the potential operating range of the well, then Rosedale will provide compensation to lower the well pump to meet the landowner's needs.

[2] Wells 29S/25E-27N1&2, 29S/25E-25M1&2, 29S/26E-31H1&2, and 29S/25E-35G01 are the wells that will be used to monitor groundwater levels. These wells have been determined to be best suited for detecting fluctuations in groundwater levels due to project operations.

- When the Model predicts a NPI outside the current and potential operating range of the well, then Rosedale will supply an equivalent water supply to the affected landowner from an alternate source at no greater cost; provide other acceptable mitigation to the landowner; or reduce or adjust pumping as necessary to prevent, avoid, or eliminate the NPI.

- Domestic Wells. The following measures would be implemented when a NPI is triggered for a domestic well:
  - When the Model predicts a NPI such that production ceases or is likely to cease, then Rosedale will provide compensation to implement one of the following: lower the domestic submersible pump bowl setting sufficient to restore and maintain service; provide a one-time permanent connection to the nearest water service provider; or drill and equip a new domestic well. If necessary, Rosedale will provide interim in-home water supplies until one of these actions is completed.

Such measures would ensure neighboring wells would not be adversely affected by the project. With implementation of the Long Term Operations Plan, the incremental contribution of the proposed project to cumulative impacts to groundwater resources would not be cumulatively considerable.

Significance Conclusion

Less than Significant with Mitigation.

Mitigation Measures

CUM-2: Operation of the proposed project shall be conducted in accordance with the *Long Term Project Recovery Operations Plan Regarding Rosedale-Rio Bravo Water Storage District Projects* (Long Term Operations Plan). The Long Term Operations Plan requires monitoring of groundwater conditions; annual predictions of project-related groundwater declines in the area; definition of negative project impact (NPI) to neighboring wells relative to no-project conditions; triggers for implementation of mitigation measures based on NPI that affects neighboring well operation; and mitigation measures to be implemented for different categories of wells. Mitigation measures include, but are not limited to, providing compensation to lower well pumps; reducing or adjusting pumping to prevent, avoid, or eliminate the NPI; or drilling a new well.

Impact CUM-3: The proposed project and related projects could result in cumulative long-term impacts to agricultural resources.

As described in **Chapter 3.2, Agricultural Resources**, the proposed project would be built on lands designated as Prime and Unique Farmland by the California Department of Conservation (CDC) Farmland Mapping and Monitoring Program (FMMP). As Stockdale West recharge facilities are fully constructed, only recovery wells, pump houses, and turnout/turn-in structures would be installed onsite. Current facilities at Stockdale East may be replaced with recharge basins, earthen berms, recovery facilities, on-site conveyance canals and pipelines and the Central Intake Pipeline, pump station and turnout. Although the third Stockdale project site has not yet

been determined, construction of recharge facilities at the site is anticipated to be similar to those proposed at Stockdale East. The proposed recharge facilities would be made available for farming, fallowing, or grazing when properties are not needed for water recharge or water management purposes. In addition, groundwater recharge is considered to be a compatible agricultural land use and would not preclude future use of the properties for agricultural production. The proposed project would not convert agricultural lands to non-agricultural use. Thus, the impact of the proposed project to agricultural resources is considered less than significant.

The cumulative impact of the proposed project on agricultural resources is dependent on the past, present, and reasonably-forseeable future conditions of development and land use in the project vicinity. There have been documented losses of farmland in Kern County since 2000. For example, there were 990,422 acres of farmland in 2000; 967,151 acres of farmland in 2004; 939,221 acres of farmland in 2008; and 914,084 acres in 2010, and 900,332 in 2012 (CDC, 2013, 2015). Over an eight year span from 2004 to 2012, Prime Farmland declined from 643,128 acres to 597,771 acres, and Unique Farmland declined from 109,318 acres to 89,694 acres (CDC, 2013, 2015,). This equates to a seven percent loss of Prime Farmland (45,357 acres) and an eighteen percent loss of Unique Farmland (19,624 acres) over six years. However, over the same time period, Grazing Lands have increased from 1,791,467 acres in 2004 to 1,843,605 acres in 2012, a three percent increase (52,138 acres).

There is an abundance of land in the vicinity of the proposed project that is categorized as Prime Farmland, Unique Farmland, and Farmland of Statewide Importance (see Figure 3.2-1). Other related projects in the area could result in the conversion of agricultural lands. Table 4-1 lists planned development projects in the vicinity of the proposed project, and Table 4-2 lists other groundwater banking programs in Kern County. Some development projects may require cancellation of Williamson Act contracts or exclusions from agricultural preserves as designated by Kern County.

The proposed project would not contribute to cumulative farmland conversion. As described in **Chapter 3.2, Agricultural Resources**, the proposed project would provide benefits to agriculture in the project vicinity by preventing the conversion of the Stockdale Properties from farmland to residential or commercial development and preventing overdraft conditions in the underlying groundwater basin, upon which regional farmers depend for irrigation water. Groundwater recharge is a compatible agricultural land use and the proposed project would not convert agricultural lands to non-agricultural use. Therefore, the incremental contribution of the proposed project to cumulative impacts to agricultural resources would not be cumulatively considerable.

Significance Conclusion

Less than Significant.

Mitigation Measures

None required.

References – Cumulative Impacts

Bakersfield Freeways, 2013. Westside Parkway. Accessed at http://www.bakersfieldfreeways.us/project_westside_parkway.html, December 17, 2013.

California Department of Conservation (CDC), 2013. Historic Land Use Conversion Tables. Accessed http://redirect.conservation.ca.gov/dlrp/fmmp/county_info_results.asp, December 19, 2013.

California Department of Conservation (CDC), 2015. Kern County, 2010-2012 Land Use Conversion. Accessed at: http://www.conservation.ca.gov/dlrp/fmmp/Pages/Kern.aspx on March 4, 2015.

California Department of Transportation (Caltrans), 2013. District 6 Project Fact Sheets. Accessed at http://www.dot.ca.gov/dist6/factsheets/, October 2013.

Caltrans, 2014. *Centennial Corridor Project, Draft Environmental Impact Report/Environmental Impact Statement and Section 4(f) Evaluation*, Project ID # 06-0000-0484, SCH #2008091102, March 2015.

California Department of Water Resources (DWR), *Kern Water Bank: First Stage Kern Fan Element Feasibility Report and Draft Supplemental Environmental Impact Report*, 1990.

California Department of Water Resources (DWR), *A Study of the Transfer, Development, and Operation of the Kern Water Bank*, 2007.

California Office of Planning and Research (OPR), 2013. State Clearinghouse CEQAnet Database. Accessed at http://www.ceqanet.ca.gov/.

Castaic Lake Water Agency, 2014. Notice of Determination for CLWA/Rosedale 2014 Drought Relief Project, October 22, 2014.

Kern County Planning Department, 2015. Kern County Construction Projects (Capital & Major Maintenance Projects). Accessed at http://www.co.kern.ca.us/apps/CMP/CMPdspinter.aspx#.UrSFIfRDv3Q on March 4, 2015.

Kern County Planning and Community Development, 2015. Environmental Documents. Accessed at: http://pcd.kerndsa.com/planning/environmental-documents on March 4, 2015.

Kern County, 1970. Zoning Map 121. Department of Planning and Development Services. Approved January 19, 1970. Accessed at http://esps.kerndsa.com/maps/zone-maps, December 17, 2013.

Kern County Water Agency, 1996. *Initial Study and Proposed Negative Declaration for the Pioneer Groundwater Recharge and Recovery Project*. November 13, 1996.

Kern Fan Monitoring Committee, 2015. State Well 30S25E04J-002M, -003M, -004M, -005M, Kern County Water Agency Groundwater Database, 1990 through February 2015.

Kern Water Bank Authority, 2012. Notice of Preparation of an Environmental Impact Report for the Kern Water Bank Conservation and Storage Project.

Kern Water Bank Authority, 2015. Kern Water Bank Authority, Background and Key Dates. Accessed at: http://www.kwb.org/index.cfm/fuseaction/pages.page/id/360, on March 2, 2015.

Manero, Ana, 2008. Comparative water management practices in California and Spain. Accessed at http://upcommons.upc.edu/pfc/bitstream/2099.1/6053/10/09.pdf, December 20, 2013.

Rosedale-Rio Bravo Water Storage District (Rosedale), 2001. *Final Master Environmental Impact Report for the Groundwater Storage, Banking, Exchange, Extraction & Conjunctive Use Program*. Prepared by Boyle Engineering Corporation, July 2001.

Rosedale, 2003. *Addendum No. 1 to Master Final Environmental Impact Report for the Groundwater Storage, Banking, Exchange, Extraction & Conjunctive Use Program*, May 2003

Rosedale, 2009. *Addendum No. 2 to Master Final Environmental Impact Report for the Groundwater Storage, Banking, Exchange, Extraction & Conjunctive Use Program*, September 2009

Rosedale, 2011. *Addendum No. 3 to Master Final Environmental Impact Report for the Groundwater Storage, Banking, Exchange, Extraction & Conjunctive Use Program*.

Rosedale, 2003. *GLC Water Banking and Recovery Program, Initial Study/Mitigated Negative Declaration*, September 2003.

Rosedale, 2008. *Final Environmental Impact Report, Strand Ranch Integrated Banking Project*, SCH No. 2007041080. Prepared by Environmental Science Associates, May 2008.

IRWD, 2010. Addendum No. 1 to *Strand Ranch Integrated Banking Project Final Environmental Impact Report*. October 2010.

Thomas Harder & Co., 2014. *Technical Memorandum: 2014 Drought Relief Project*. Prepared for Rosedale-Rio Bravo Water Storage District. November 3, 2014.

Thomas Harder & Co., 2015. *Draft Proposed Stockdale Integrated Banking Project – Analysis of Potential Groundwater Level Changes from Recharge and Recovery at the Stockdale West and Stockdale East Facilities*. Prepared for Rosedale-Rio Bravo Water Storage District and Irvine Ranch Water District. January 23, 2015.

Thomas Road Improvement Program (TRIP), 2015. Project Information. Accessed at: http://www.bakersfieldfreeways.us/ on March 4, 2015.

CHAPTER 5
Growth Inducement Potential

5.1 Overview

The *CEQA Guidelines* (Section 15126.2(d)) require that an EIR evaluate the growth-inducing potential of a proposed action. Growth inducing potential is defined by the *CEQA Guidelines* as:

> …the ways in which a proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this definition are public works projects, which would remove obstacles to population growth…. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.

A project can have direct and/or indirect growth inducement potential. Direct growth would result if a project involved construction of new housing. A project can have an indirect growth inducement effect if it would establish substantial, new, or permanent employment opportunities and indirectly stimulate the need for additional housing and services. Similarly, a project would have an indirect growth inducement effect if it would remove an obstacle to additional growth and development, such as providing urban services, such as water supply, to un-served or underserved areas.

The proposed project would not directly cause growth. This section reviews the population growth projections for Rosedale and IRWD service areas and describes the existing and projected water demand and water supply conditions. It provides a description of both districts' role in providing water to customers within their service areas and evaluates the potential for the proposed project to have an indirect effect to growth by removing an obstacle to growth.

5.2 Population

IRWD Service Area

Population within IRWD's service area is projected to increase 32 percent by 2035, from 337,876 in 2010 to approximately 446,633 in 2035 (IRWD, 2011). A significant portion of this growth is due to development by The Irvine Company, Tustin Legacy (former MCAS Tustin) and development of Heritage Fields at the Orange County Great Park. Water demand is expected to increase as a direct function of the planned growth in population, as well as related planned housing and employment markets.

The northern portion of Orange County was extensively developed in the 1970s and 1980s and continues to increase in population density. Between 2000 and 2011, Orange County's population increased by seven percent, an annual growth rate of approximately 0.63 percent.

Southern California as a whole has had a population growth rate of 10.55 percent, or an annual increase of 0.96 percent (SCAG, 2012b). As shown in **Table 5-1**, the Southern California Association of Governments (SCAG) projects that Orange County's population will increase to 3.42 million by the year 2035, an approximate 14.5 percent increase over 2008 population. SCAG estimates that most of the projected growth in Southern California will result from local birth rates rather than immigration, which accounted for most of the growth in the 20th Century. The data source for IRWD's population statistics is the Center for Demographic Research, California State University, Fullerton (2010) using the California State Department of Finance population data..

TABLE 5-1
IRWD POPULATION PROJECTIONS

	2008	2020	2035
Orange County [a]	2,989.000	3,266,000	3,421,000
IRWD[b]	337,876	381,379	446,633

SOURCES: (a) SCAG 2012a RTP Growth Forecast; (b) IRWD Urban Water Management Plan, November 2011.

Rosedale Service Area

The Rosedale service area consists predominately of rural agricultural land uses. However, its eastern portions are within the Metropolitan Bakersfield planning area and are experiencing development and population growth. The City of Bakersfield in coordination with Kern County prepared a General Plan in 2002 evaluating growth in the Bakersfield sphere of influence (SOI) (City of Bakersfield and Kern County, 2007). The proposed project boundaries are partially located within the designated City of Bakersfield SOI. Based on the Kern Council of Governments (COG) most recently published Regional Transportation Plan (RTP), the Metropolitan Bakersfield Planning would have an estimated population growth of 59 percent by the year 2035 (**Table 5-2**). The population of the City of Bakersfield was 350,020 in 2010, approximately 65 percent of the Metropolitan Bakersfield Planning Area population of 533,461 (Dept of Finance, 2011).

TABLE 5-2
ROSEDALE POPULATION PROJECTIONS

	2010	2020	2035
Kern County	845,600	1,010,800	1,321,000
Metropolitan Bakersfield	533,461	640,536	848,487

SOURCES: Kern COG, 2011 RTP, July 2010

5.3 Water Supply and Demand

IRWD

IRWD is a member agency of the Municipal Water District of Orange County (MWDOC) and receives approximately 22 percent of imported water from MWD through MWDOC. Water imported to IRWD comes from the Sacramento-San Joaquin Delta in Northern California and the Colorado River. Approximately 50 percent of IRWD's overall supply comes from local groundwater wells in the Orange County Groundwater Basin, and the Irvine and Lake Forest sub-basins. OCWD replenishes the groundwater basin largely by recharging Santa Ana River water, highly treated, high-quality recycled water into the aquifer and by importing some additional water from MWD for recharge as well. IRWD also receives water from other local sources including the Santiago Creek watershed and by recycled water resources produced by IRWD. **Table 5-3** shows the supply and demand for a single dry year forecast.

TABLE 5-3
IRWD'S SINGLE DRY-YEAR SUPPLY AND DEMAND (AFY)

	2015	2020	2035
Supply Totals	133,214	160,408	160,408
Demand Totals	98,169	114,586	119,873
Difference	35,045	45,822	40,535
Difference of % of Supply	26%	29%	25%
Difference of % of Demand	36%	40%	34%

SOURCE: IRWD Water Resources Master Plan, 2014.

MWD manages and coordinates the delivery of imported surface water supplies from the Colorado River and from Northern California through the State Water Project with six southern California counties including Orange County. MWDOC, a member agency of MWD, is a water wholesale agency that does not provide water directly to customers but rather purchases it from MWD and sells it to its approximately 30 member agencies, comprising cities and water districts throughout the county. These member agencies, including IRWD, are the local water retailers, selling water directly to their local customers.

MWD provides approximately 50 percent of the water supply for Orange County, on average. **Table 5-4** summarizes MWD's single dry-year supply portfolio through 2030, identifying existing supplies and the supplies under development both for additional import as well as locally within MWD's service area. As shown in the table, MWD has developed a multiple supply portfolio to meet current demands and to accommodate growth demands within its service area without increasing pressure on groundwater production. MWD's supply forecasts provide estimations of supply reliability for local member agencies to base future supply requirements. Actual reliability of supplies could vary depending on implementation of proposed projects.

TABLE 5-4
MWD'S SINGLE DRY-YEAR SUPPLY CAPABILITY AND TOTAL DEMAND (AFY)

	2015	2020	2035
Current Programs			
In-Region Storage and Programs	685,000	931,000	830,000
California Aqueduct	522,000	601,000	610,000
Colorado River Aqueduct Capability	1,250,000	1,250,000	1,250,000
Capability of Current Programs	**2,457,000**	**2,782,000**	**2,690,000**
Total Demands on MWD	**2,171,000**	**2,162,000**	**2,319,000**
Surplus	**286,000**	**620,000**	**371,000**
Programs Under Development			
In-Region Storage and Programs	206,000	306,000	336,000
California Aqueduct	556,000	700,000	700,000
Colorado River Aqueduct Supply	187,000	187,000	187,000
Capability of Proposed Programs	**762,000**	**862,000**	**1,036,000**
Potential Surplus	**1,048,000**	**1,482,000**	**1,407,000**

SOURCE: MWD, Regional Urban Water Management Plan, Table 2-9, November 2010.

In recent years, MWD's primary water supplies have come under pressure. As Arizona approaches full use of its Colorado River entitlement, MWD's diversion of Colorado River water may decrease. This decrease in diversion is accounted for in MWD's most recent Regional Urban Water Management Plan. To make up for the decrease, MWD has identified local projects and conservation measures to meet increasing demand. In addition, supply availability from the Sacramento-San Joaquin Delta will continue to be constrained due to curtailments in pumping and water deliveries due to special-status species such as the endangered Delta smelt. Such curtailments reduce the reliability of MWD's future supplies.

IRWD's system is reliable due to its interdependent sources of supply. A shown in Tables **5-3** and **Table 5-5**, projected water supplies are shown to be sufficient to meet customer needs through 2035. This assumes that there will be an increase in recycled water use and local groundwater production (**Table 5-6**) through planned projects and that imported water purchased through MWD would remain constant. Water demand is expected to increase as the population grows. **Table 5-5**

summarizes IRWD's water supply portfolio projected to the year 2035. The proposed project is not included in this portfolio because it is being developed as a dry-year supplemental supply only.

TABLE 5-5
IRWD CURRENT AND PLANNED WATER SUPPLIES (AFY)

	2015	2020	2035
Potable Supplies:			
Purchased MWD Treated	41,929	41,929	41,929
Groundwater	49,170	49,170	49,170
Baker Water Treatment Plant	0	6,858	6,858
Future Groundwater Projects	0	12,787	12,787
Total Potable Supply Capability:	**91,099**	**110,744**	**110,744**
Build-out Demand potable:	**63,403**	**76,266**	**81,993**
Non-potable Supplies:			
Recycled Water	26,135	26,135	26,135
Purchased MWD Untreated	21,221	24,262	24,262
Native (Surface Water)	3,000	0	0
Non-potable Groundwater	3,514	3,514	3,514
Total Non-potable Supply Capability	**53,870**	**53,911**	**53,911**
Build-out Demand non-potable:	**28,344**	**30,823**	**30,037**
Total Planned Water Supply:	**144,969**	**164,655**	**164,655**

SOURCE: IRWD Water Resources Master Plan, 2014.

TABLE 5-6
AMOUNT OF GROUNDWATER PROJECTED TO BE PUMPED (AFY)

Location	2015	2020	2030
Orange County Groundwater Basin	**43,861**	**56,213**	**56,213**
Irvine Subbasin (Irvine Desalter)	**8,823**	**8,823**	**8,823**
Los Alisos Area	**-**	**435**	**435**
Total	**52,684**	**65,471**	**65,471**
Local Groundwater as a % Total of Water Supply	**36%**	**40%**	**40%**

SOURCE: IRWD Water Resources Master Plan, 2014.

IRWD's UWMP evaluates multiple dry-year drought supplies and identifies sources of supply to meet actual demands. Generally, during periods of drought, should MWD's sources be stressed through multiple dry years, or suffer catastrophic failure, IRWD could augment water supplies through increased local groundwater pumping on a short-term basis, as well as reduce demands through increased conservation measures as described in IRWD's UWMP. The proposed project

would help to augment IRWD's dry-year supply portfolio to enhance water supply reliability and redundancy..

Redundant water sources also enhance the system's overall reliability for potential scenarios such as catastrophic failures of water conveyance infrastructure, a shut-down of Delta water supplies, or water quality issues in the SWP. To plan for these contingencies, a diverse water supply portfolio provides the highest degree of reliability.

Rosedale

Rosedale is dominated by agricultural land uses and thus water use is primarily for agricultural irrigation. Water use in the District varies from year to year depending on the crops that are grown and the amount of land that remains fallow. However, as more permanent crops are grown and more land is converted to urban development, the fluctuations in water use have become less pronounced (Rosedale, 2013). Water used for irrigation within Rosedale's service area is primarily obtained from groundwater pumping, although about 10,000 to 15,000 AFY of surface water is delivered by Rosedale to landowners for use during wet years. Consumptive use within the District is currently estimated to be about 93,000 AFY, including the consumptive use of precipitation (Rosedale, 2013). For the period from 1993 through 2011, the average annual consumptive use has been estimated to be about 92,000 AFY. **Table 5-7** summarizes consumptive use within the Rosedale service area since 1976. As shown in the table, average urban use has doubled since 1990 as crop use has been decreased slightly. This trend is expected to continue.

TABLE 5-7
HISTORIC CONSUMPTIVE USE WITHIN ROSEDALE DISTRICT (AFY)

Period	Crop Use	Urban Use	Subtotal
1976-1990	86,968	3,772	90,740
1991-2005	84,311	6,920	91,231
1993-2011	--	--	92,000
2012	84,500*	8,500	93,000

• Includes Crop use plus fallow and undeveloped land use.

SOURCE: Rosedale Rio-Bravo Water Storage District, 2013.

5.4 Growth Inducement Potential

The proposed project would provide additional groundwater recharge, storage and recovery capacity in the Kern Fan region to augment Rosedale's Conjunctive Use Program and enhance supply reliability for IRWD during periods when other supplies are reduced or interrupted. The proposed project would not have a direct growth-inducing effect within the IRWD service area or the Rosedale district boundaries. The proposed project does not involve construction of new housing and would not substantially expand or establish new employment opportunities that, in turn, would generate housing development. Nor would the proposed project provide water supply infrastructure to a previously undeveloped or underserved region.

The proposed project provides water supply reliability to IRWD through redundancy and diversification of water supply options available in future years. IRWD has more than adequate water supplies (existing and under development) to meet projected demands to the year 2035. This proposed project provides a means of offsetting existing supplies during periods when existing sources may be reduced or interrupted and provides a cost effective means of managing contingency and drought planning needs. The proposed project would not be capable of providing water every year and therefore could not support the continuous demands associated with population growth. The Urban Water Management Planning Act of 1993 requires major water suppliers to identify sources of water to meet three-year drought scenarios. Options to show that water would be available for such a drought include providing drought-proof water supplies such as desalinated water and recycled water or constructing substantial storage capacity. The proposed project provides a future drought supply to augment the district's drought planning requirements. Drought planning provides for supply reliability but does not accommodate additional demand.

Neither IRWD nor Rosedale has authority or responsibility for approving land use designations. Neither district makes decisions about approving new development that would require connections to potable water supplies. Planning in the IRWD service area is the responsibility of all municipalities within IRWD's service area. Cities within the IRWD service area include the cities of Irvine, Tustin, Orange, Newport Beach, Lake Forest, and Costa Mesa. Some unincorporated areas of the County of Orange are also within IRWD's service area boundary. Rosedale encompasses several cities, but the City of Bakersfield sphere of influence dominates the growth projections. The cities and the counties are responsible for identifying and accommodating growth within their boundaries. Each city and county has prepared a General Plan that identifies growth projections specific to their areas. Each of the cities and counties acknowledge that population is increasing and each entity has identified significant impacts associated with the growth. Each entity has adopted overriding considerations pursuant to CEQA requirements, acknowledging that growth results in secondary impacts that may be significant and unavoidable. These impacts include increased air pollution, traffic congestion, and loss of open space and farmland.

Water banking provides for effective groundwater management within the Rosedale service area that benefits overlying groundwater users and banking entities. Water banking does not promote or induce growth within the Rosedale service area. Use of property for recharge basins prevents other development on the site and is compatible with existing agricultural land uses in the area.

The proposed project neither supports nor encourages growth within the IRWD or Rosedale service areas to a greater degree than presently estimated by the agencies with land use jurisdiction within their service areas. The proposed project would not remove any obstacles to growth and would not indirectly have a significant impact on growth inducement.

References – Growth Inducement Potential

California Department of Finance, 2011. *E-5 Population and Housing Estimates for Cities, Counties, and the State, January 2011-2013, with 2010 Benchmark.* Accessed at: http://www.dof.ca.gov/Research/demographic/reports/estimates/e-5/2011-20/view.php.

City of Bakersfield and Kern County, 2007. *Metropolitan Bakersfield General Plan*

Irvine Ranch Water District (IRWD), 2011. *2010 Urban water Management Plan*.

IRWD, 2014 *Water Resources Master Plan*.

Kern Council of Governments, 2010. *2011 Final Regional Transportation Plan.*

Municipal Water District (MWD), 2010. *Regional Urban Water Management Plan, Table 2-9.*

Rosedale-Rio Bravo Water Storage District, 2013. *Groundwater Management Plan*. Prepared by AECOM, February 2013.

Southern California Associated Governments (SCAG), 2011. *Draft Program Environmental Impact Report SCAG 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy*.

Southern California Associated Governments (SCAG), 2012a. *2012 Draft RTP Growth Forecast.* Accessed at http://www.scag.ca.gov/DataAndTools/Pages/GrowthForecasting.aspx.

Southern California Associated Governments (SCAG), 2012b. *2013-2035 Regional Transportation Plan 2012-2035.*

CHAPTER 6
Alternatives Analysis

6.1 CEQA Requirements for Alternatives Analysis

CEQA requires that an EIR describe and evaluate a reasonable range of feasible alternatives to a project, or to the location of a project, that would attain most of the project objectives and avoid or substantially lessen significant project impacts. CEQA Guidelines (§15126.6) set forth the following criteria for alternatives:

> **Identifying Alternatives.** The range of alternatives is limited to those that would avoid or substantially lessen any of the significant effects of the project, are feasible, and would attain most of the basic objectives of the project. Factors that may be considered when addressing the feasibility of an alternative include site suitability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries, economic viability, and whether the proponent can reasonably acquire, control or otherwise have access to the alternative site. An EIR need not consider an alternative whose impact cannot be reasonably ascertained and whose implementation is remote and speculative. The specific alternative of 'no project' shall also be evaluated along with its impact.
>
> **Range of Alternatives.** An EIR need not consider every conceivable alternative, but must consider a reasonable range of alternatives that will foster informed decision-making and public participation. The "rule of reason" governs the selection and consideration of EIR alternatives, requiring that an EIR set forth only those alternatives necessary to permit a reasoned choice.
>
> **Evaluation of Alternatives.** EIRs are required to include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the project. Matrices may be used to display the major characteristics of each alternative and significant environmental effects of each alternative to summarize the comparison. If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative must be discussed but in less detail than the significant effects of the project.

6.1.1 Project Objectives

The objectives of the proposed project are as follows:

- Integrate the proposed project facilities and coordinate the proposed project operations with Rosedale's Conjunctive Use Program, including the Strand Ranch Project, to provide for maximum operational flexibility between the various programs and facilities.

- Provide additional groundwater recharge, storage, and recovery capacity in the Kern River Fan region to augment and provide operating flexibility for Rosedale's existing and future programs.
- Develop recharge and recovery capacities for each of IRWD's and Rosedale's respective properties to be available for its priority use and for the other agency's use to the extent unused capacity may be available.
- Develop additional groundwater recharge, storage, and recovery capacity to provide IRWD customers with increased water supply reliability through redundancy and diversification during periods when other supply sources may be reduced or interrupted.

6.1.1 Key Impacts of the Proposed Project

Chapter 3 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. Mitigation measures were identified to render impacts less than significant. No significant unavoidable impacts would result from implementation of the proposed project. A summary of the significance of the greatest impacts for each environmental resource analyzed in Chapter 3 is presented below in **Table 6-1**. Specific impacts and all mitigation measures are provided in Table ES-1 in the Executive Summary of this Draft EIR.

6.2 Alternatives to the Project

6.2.1 Alternatives Considered But Rejected

This section identifies other project alternatives that were considered but rejected from further consideration.

Recharge Basin Location Alternative

Rosedale and IRWD considered alternative locations to Stockdale East and Stockdale West for constructing groundwater banking facilities. Recharge, recovery, and conveyance facilities would be designed to accommodate the alternative location. The majority of the properties identified by Rosedale and IRWD were located within the radius identified for the third Stockdale site, in addition to two areas southeast of the proposed project. Within the site radius, locations considered were: east of Stockdale East (approximately 1,100 acres total) and west of Stockdale West (approximately 160 acres) along the northern side of the Cross Valley Canal; directly north of the Strand Ranch property (approximately 340 acres total); and northwest of the Stockdale West property (approximately 160 acres). Southeast of the proposed project, locations were considered approximately 5.6 miles and 10.7 miles (230 acres) from the proposed project.

TABLE 6-1
SUMMARY OF PROJECT IMPACT ANALYSIS

Environmental Resource	Significance Determination
Aesthetics	LSM
Agriculture and Forestry Resources	LSM
Air Quality	LTS
Biological Resources	LSM
Cultural Resources	LSM
Geology, Soils, and Seismicity	LSM
Greenhouse Gas Emissions	LTS
Hazards and Hazardous Materials	LSM
Hydrology and Water Quality	LSM
Land Use and Planning	LTS
Mineral Resources	LTS
Noise	LSM
Transportation and Traffic	LSM
Utilities and Energy	LSM
Cumulative Impacts	LSM

LTS = Less than Significant
LSM = Less than Significant with Mitigation

SOURCE: ESA 2014.

All potential project locations were evaluated based on a list of criteria that defined the ideal conditions for implementation of the proposed project. The criteria included the following:

- The property is available for purchase and at an economically-feasible price;
- Development costs are reasonable and economically feasible;
- Soil permeability conditions and infiltration rates are adequate for groundwater recharge;
- There is an unconfined aquifer below the property (i.e. no clay layers that could impede long term recharge and storage);
- There is adequate storage space in the aquifer below the property;
- Groundwater quality is compatible with pump-in requirements of the California aqueduct;
- Existing conveyance facilities are proximate to the property; and
- Other environmental constraints such as soil quality and existing land use are compatible with a groundwater banking project.

Environmental impacts associated with implementing the proposed project in other locations would likely be similar and would meet the project objectives. Additional tie-ins or more linear feet of conveyance structures might be required, depending on location and proximity to the CVC or other regional conveyance facilities. This could result in greater construction-related

environmental impacts. Nonetheless, based on property inquiries, some alternative locations were either too small or too expensive to purchase and develop in a manner that was economically feasible or prudent; other locations were unavailable (not for sale). As a result, the location alternative was rejected from further analysis.

Rosedale considered alternative locations to the Central Intake alignment. The alignments were evaluated based on the following goals that defined the ideal conditions for implementation of the proposed project:

- Maximize conveyance flexibility to and from Stockdale East, Superior Ponds, Goose Lake Slough, and the CVC.
- Minimize distance between facilities to minimize environmental disturbance.
- Minimize costs associated with construction.
- Minimize pumping requirements;
- Maximize the use of existing easements, rights-of-way, and roadways to minimize disturbance to private landowners.

Once a general alignment was determine variations to the general alignment were analyzed and discussed with affected landowners. The adjustments were within the same general vicinity as the proposed alignment, with modifications to the locations of the crossing of Stockdale Highway, PG&E transmission line easements, and the railroad; the route through the agricultural lands between Stockdale Highway and Brimhall Road; and associated location of the connection point to the Goose Lake Slough. The final alignment accomplished the goals of the proposed intake while minimizing impacts to the public and the environment.

The Central Intake feasibility evaluation also included consideration of whether a pipeline or canal would be constructed. Both options were analyzed and alignments considered. A pipeline was selected over a surface canal because it minimized the required footprint of the facilities and associated crop loss, maintenance requirements, and access issues. The canal option, while not as cost effective relative to construction, was eliminated because it did not minimize impacts to the environment or the affected landowners as well as the pipeline option.

Injection Well Alternative

Under the Injection Well Alternative, Rosedale and IRWD would construct injection wells on the Stockdale Properties to inject water into the groundwater basin rather than construct recharge basins on the surface. This proposed alternative would require approximately 10 injection wells to provide the equivalent recharge of the proposed recharge basins. This proposed alternative would include construction of large water storage facilities on site at the Stockdale Properties to hold water for injection. The other components of the project, including conveyance and extraction facilities, would be similar to the proposed project. The Injection Well Alternative would be cost prohibitive. In addition, the aquifer characteristics make injection at this level not practical. Due to cost limitations and operational impracticalities, this alternative was rejected from further analysis.

Orange County Storage

Water storage facilities could be constructed in Orange County to provide water supply reliability during dry years for IRWD. IRWD could develop an in-county storage program either by (a) partnering with Orange County Water District (OCWD) to develop a banking program to store water in the Orange County Groundwater Basin or (b) constructing surface storage facilities.

OCWD has approved a groundwater banking project with Metropolitan, which is IRWD's imported water provider. OCWD is not partnering with individual retail water agencies to develop groundwater banking programs at this time. Therefore, a groundwater banking program within Orange County is not feasible.

IRWD could construct surface storage facilities within its service area, such as reservoirs and tanks, to store water during wet years for use during dry years and multiple-drought years. Implementing an in-county surface storage program would require IRWD to purchase a substantial amount of land that could accommodate enough storage reservoirs and tanks with a combined maximum capacity of 50,000 AF. Environmental impacts associated with constructing a surface reservoir would likely be significant. In order to store a cumulative volume of water equivalent to the proposed project, the land acquisition required and implementation process is cost prohibitive for IRWD at this time.

Conservation

IRWD manages a water conservation program to reduce water demand in its service area. IRWD is a signatory to the Memorandum of Understanding Regarding Water Conservation in California (MOU) (August 1991). The MOU requires IRWD to implement programs designed to comply with or exceed prescribed urban water conservation Best Management Practices (BMPs) requirements (IRWD, 2011). The BMPs are intended to reduce long-term urban water demand. IRWD complies with the BMP requirements by implementing the California Urban Water Conservation Council (CUWCC) foundational BMPs and through the Gallons Per Capita Day (GPCD) calculation reporting system. The CUWCC foundational BMPs are:

1. Utility Operations
    a. Conservation Coordinator
    b. Water Waste Prevention
    c. Water Loss Control
    d. Metering and Commodity Rates
    e. Retail Conservation Pricing
2. Education Programs
    a. Public Information Programs
    b. School Education Program

In addition to the foundational BMPs, agencies have the option of implementing Programmatic BMPs or use the Flex Track approach which provides agencies with flexibility to implement a combination of programs within their service area.

Since 2005, IRWD has provided over $3 million in tactical incentives for approximately 95,000 devices (e.g. water efficient devices) with estimated lifetime water savings of almost 9,000 acre feet. This does not achieve the objective of the proposed project, however, to provide IRWD customers with increased water supply reliability through redundancy and diversification during periods when existing imported supplies are reduced or interrupted. Under extreme shortage scenarios, IRWD can temporarily implement further demand reduction efforts as described in IRWD's Water Shortage Contingency Plan. Conservation efforts combined with supplemental supplies provided by the proposed project to augment IRWD's supply portfolio provide the most effective and reliable water supply alternative. Therefore, conservation by itself was not considered feasible to achieve the project objectives.

Recycled Water

IRWD has an extensive water recycling program, which began in 1967. IRWD currently meets almost a quarter of its total demands with recycled water, and as a result reduced demands for potable and imported water (IRWD, 2011). Recycled water is primarily used for landscape and agricultural irrigation and other non-potable uses, such as industrial processes, cooling towers, and interior flushing in now 62 dual plumbed buildings. Currently, recycled water is used for 95 percent of all irrigation in IRWD's service area and meets over 23 percent of IRWD's total water resource demand (IRWD, 2011). IRWD has a dual distribution system that delivers recycled water from the Michelson Water Reclamation Plant (MWRP) and the Los Alisos Water Reclamation Plant (LAWRP) to non-potable end users (IRWD, 2011). IRWD has nearly completed construction of the MWRP Phase II Expansion project, which will increase the MWRP treatment capacity by an additional 10 million gallons per day (mgd), from 18 mgd to 28 mgd. By 2025, IRWD's total recycled water production capacity at the MWRP and LAWRP would be approximately 33 mgd by 2025. Recycled water that is produced during winter months, when irrigation demand is typically low, is delivered to seasonal recycled water storage reservoirs for later use during dry months.

The quality of recycled water effluent used for landscape irrigation and agriculture complies with Title 22, Division 4 of the California Administrative Code, Department of Public Health. Recycled water production is considered "drought-proof" because wastewater flow typically remains constant even during dry years, however, recycled water can only be used for state-approved non-drinking water uses. Additional recycled water use expansion could not be implemented as an alternative to the proposed project because IRWD already extensively serves recycled water to meet non-potable demands which has reduced potable water use. When imported water supplies may be cutback due to drought or interrupted, IRWD cannot use recycled water to meet potable water demands and therefore would need to augment potable water supply. Therefore, recycled water was not considered as a feasible project alternative.

6.2.2 No Project Alternative

According to Section §15126.6(e) of the CEQA Guidelines, discussion of the No Project Alternative must include a description of existing conditions and reasonably-foreseeable future conditions that would exist if the project were not approved. Under the No Project Alternative, IRWD would not construct recovery wells on Stockdale West; Rosedale would not construct recharge basins and recovery wells on Stockdale East; and the Central Intake Pipeline would not be built. Stockdale East would continue to be operated for agricultural production and Stockdale West also would accommodate agricultural activities within the existing recharge basins, including grazing. Groundwater would continue to be pumped from agricultural wells to support agricultural activities at both properties, with no recharge to offset such pumping. The third Stockdale project site would not be identified and developed, and the Stockdale Properties would not be integrated with Rosedale's Conjunctive Use Program. Under the No Project Alternative, IRWD's water supply would be less reliable during periods when existing supplies may be reduced or interrupted. Rosedale would continue to explore and develop partnerships with other water districts within or outside of the Kern Fan to expand its Conjunctive Use Program.

Ability to Meet Project Objectives

Implementation of the No Project Alternative would not provide the benefits of enhanced water supply reliability during dry periods for IRWD customers when other supply sources may be reduced or interrupted and would not provide additional recharge and recovery capacity for Rosedale's Conjunctive Use Program. Implementation of the No Project Alternative would not meet any of the stated project objectives and would not address IRWD's need for water supply reliability, redundancy, and diversification.

Impact Analysis

Under the No Project Alternative, the identified impacts associated with constructing and operating the proposed project would be avoided, such as impacts to air quality, noise, traffic, biological resources, and cultural resources. Under the No Project Alternative, during temporary periods when existing supplies are reduced due to drought or are interrupted, potable water demand in the IRWD service area would continue to be met with potentially less imported water and local groundwater supplies. It is expected that other water suppliers who produce water from the Orange County basin will also experience cutbacks of imported supplies and will increase groundwater production, and the OCWD imported replenishment water may also be cutback. This increased utilization of the basin could result in an accumulated overdraft that may only be sustainable for short durations. . During periods of catastrophic supply interruption and multi-year drought conditions, IRWD's water supply would be less reliable. Under the No Project Alternative, IRWD would not benefit from the water supply redundancy and diversification provided by the proposed project. IRWD would be more vulnerable to water supply disruptions caused by drought or other catastrophic water supply interruptions due to infrastructure failures, Delta water supply reductions, or reductions in other imported water deliveries from MWD.

Under the No Project Alternative, Rosedale would not have access to the recharge and recovery facilities proposed for the Stockdale Properties. Rosedale would be limited to the recharge

capacity of its existing recharge basins and forego any potential benefits to groundwater storage and overdraft correction associated with the proposed project. This includes foregoing correction of overdraft caused by groundwater pumping at Stockdale East to support existing farming practices.

6.3 Summary of Alternatives Analysis

One of the primary purposes of the alternatives analysis is to identify project alternatives that may avoid or substantially lessen significant project impacts (*CEQA Guidelines* §15126.6). The proposed project would not result in any significant impacts as documented in the analyses provided in Chapters 3, 4, and 5 of this Draft EIR. Nonetheless, CEQA requires that an EIR shall assess the No Project Alternative. A comparison of the proposed project to the No Project Alternative presents a tradeoff between achieving project objectives and impacting the environment. The No Project Alternative would avoid all the environmental impacts of the proposed project but would not meet any of the project objectives. The No Project Alternative also would forego any environmental benefits to the San Joaquin Valley Groundwater Basin such as correction of overdraft conditions, including those due to groundwater pumping to support irrigated agriculture at the Stockdale East property.

CEQA requires that an EIR identify the environmentally superior alternative of a project other than the No Project Alternative (*CEQA Guidelines* §15126.6(e)(2)). Since the proposed project would be compatible with agricultural land uses, support sustainable use of groundwater for agriculture in Kern County, benefit the San Joaquin Valley Groundwater Basin through recharge and storage, enhance water supply reliability for IRWD, and not result in any significant impacts that cannot be mitigated, the proposed project is considered the environmentally superior alternative.

TABLE 6-2
SUMMARY OF ALTERNATIVES ANALYSIS
RELATIVE IMPACTS AS COMPARED TO THE PROPOSED PROJECT

Environmental Resource	Proposed Project	No Project Alternative
Meets All Project Objectives?	Yes	No
Environmental Impacts		
Aesthetics	LSM	-
Agriculture and Forestry Resources	LSM	-
Air Quality	LTS	-
Biological Resources	LSM	-
Cultural Resources	LSM	-
Geology, Soils, and Seismicity	LSM	-
Greenhouse Gas Emissions	LTS	-
Hazards and Hazardous Materials	LSM	-
Hydrology and Water Quality	LSM	+
Land Use and Planning	LTS	-
Mineral Resources	LTS	-
Noise	LSM	-
Transportation and Traffic	LSM	-
Utilities and Energy	LSM	-
Cumulative Impacts	LSM	-

LTS = less than significant
LSM = less than significant with mitigation
+ = more severe/more intense
- = less severe/less intense
0 = no change

SOURCE: ESA 2015.

References – Alternatives Analysis

California Urban Water Conservation Council, 2013. Website: Resource Center – BMP Reporting Support. Accessed at: http://www.cuwcc.org/2column.aspx?id=16560.

Irvine Ranch Water District, 2011. *2010 Urban Water Management Plan.*

CHAPTER 7
Report Preparers

7.1 Project Sponsor / Lead Agency

Rosedale-Rio Bravo Water Storage District

P.O. Box 20820
Bakersfield, CA 93390-0820

Eric Averett, General Manager
Dan Bartel, Assistant General Manager

7.2 Project Sponsor / Responsible Agency

Irvine Ranch Water District

15600 Sand Canyon Avenue
Irvine, CA 92618

Paul Weghorst, Executive Director of Water Policy
Fiona Sanchez, Director of Water Resources
Kellie Welch, Water Resources Manager

7.3 EIR Authors and Consultants

Environmental Science Associates

626 Wilshire Blvd, Suite 1100
Los Angeles, CA 90017

Tom Barnes, Project Director
Jennifer Jacobus, PhD, Project Manager
Sarah Spano, Deputy Project Manager

Gregory Ainsworth
Candace Ehringer
Matthew Gonzalez
Matthew Morales
Tommy Moolio
Jason Neilsen
Dallas Pugh
Timothy Rimpo
Denise Russell
Eric Schniewind
Matthew South
Nicolle Steiner
Monica Strauss
Terrance Wong

Thomas Harder & Co.

Groundwater Consulting
1260 N. Hancock St., Suite 109
Anaheim, CA 92807

Thomas Harder, Principal Hydrogeologist

Appendix A

Scoping Report

626 Wilshire Boulevard
Suite 1100
Los Angeles, CA 90017
213.599.4300 phone
213.599.4301 fax

www.esassoc.com

Scoping Summary

date October 24, 2013

to Eric Averett, General Manager, Rosedale-Rio Bravo Water Storage District
Paul Weghorst, Director of Water Resources, Irvine Ranch Water District

from Jennifer Jacobus

subject Stockdale Integrated Banking Project Public Scoping

ROSEDALE RIO-BRAVO WATER STORAGE DISTRICT
STOCKDALE INTEGRATED BANKING PROJECT

Scoping Summary

Introduction

Rosedale-Rio Bravo Water Storage District (Rosedale), as the Lead Agency, in consultation with the Irvine Ranch Water District (IRWD), as a Responsible Agency, has proposed the Stockdale Integrated Banking Project (proposed project). The proposed project would allow both agencies to utilize available storage in the local San Joaquin Valley Groundwater Basin by developing groundwater banking facilities on up to three properties located approximately six miles west of the City of Bakersfield in western Kern County. The proposed project would include the Stockdale East property, which is owned by Rosedale, the Stockdale West property, which is owned by IRWD, and a potential third property that would be located within a designated radius around both properties in the unincorporated Kern County, California. Operation of the proposed project would be coordinated with Rosedale's existing Groundwater Storage, Banking, Exchange, Extraction & Conjunctive Use Program, which includes the existing Rosedale-IRWD Strand Ranch Integrated Banking Project. The proposed project would provide greater operational flexibility for Rosedale and would enhance water supply reliability for IRWD by providing contingency storage to augment supplies during dry-year periods when other supply sources may be limited or not available.

Notice of Preparation and Notice of Availability

The Notice of Preparation (NOP) was prepared pursuant to the California Environmental Quality Act (CEQA), to notify interested parties that Rosedale and IRWD will be preparing an Environmental Impact Report (EIR) to evaluate potential environmental impacts of the proposed project (see Attachment 1). The NOP was mailed on

September 24, 2013 to interested parties, including local, state, and federal agencies; news publications; and other groups or individuals who had previously expressed interest in the project. The NOP also was posted by the County Clerk in both Kern County and Orange County (see Attachment 1). A Notice of Completion (NOC) was also prepared by Rosedale and IRWD and sent to the State Clearinghouse. The proposed project was given a State Clearinghouse number of SCH# 2013091076, and the project information was posted in the CEQAnet Database (see Attachment 2). Copies of the NOP were made available for public review at local libraries (Beale Memorial Library in Bakersfield, CA and Heritage Park Regional Library in Irvine, CA). Copies of the NOP are also available for public review at the Rosedale website (www.rrbwsd.com) and at the IRWD website (www.irwd.com).

Scoping Period

The 30-day project scoping period began with the distribution of the NOP on September 24, 2013 and remained open through October 24, 2013. During the scoping period, one scoping meeting was held on October 15, 2013 at IRWD headquarters (15600 Sand Canyon Avenue, Irvine) and another scoping meeting was held on October 16, 2013 at Rosedale headquarters (849 Allen Road, Bakersfield). Public notices of the scoping meetings were placed in the Bakersfield Californian and Orange County Register newspapers (see Attachment 7).

At the scoping meetings, ESA gave a presentation on the proposed project and the CEQA process (see Attachment 3). No meeting participants attended the October 15, 2013 scoping meeting aside from ESA and IRWD staff. Only two meeting participants attended the October 16, 2013 scoping meeting at the Rosedale headquarters. Participant questions and comments were recorded and comment cards were also available for participants to fill out at the meeting or to send in at a later date. The sign-in sheet from the October 16, 2013, public scoping meeting is included as Attachment 4.

Comments

During the scoping period, Rosedale received a total of four (4) comment letters on the proposed project via mail and e-mail (see Attachment 5). Rosedale and IRWD received verbal comments during the scoping meeting, which have been recorded as Attachment 6.

The next formal opportunity for public comments will be associated with the release of the Draft Environmental Impact Report, expected to be available for public review in Winter 2014.

Contents of this Report

This Scoping Summary contains documents pertinent to the scoping process. The following items are included:

Attachment 1: Notice of Preparation
Attachment 2: Notice of Completion
Attachment 3: Scoping Meeting Presentation
Attachment 4: Scoping Meeting Sign-in Sheets
Attachment 5: Comment Letters Received by Rosedale
Attachment 6: Scoping Meeting Verbal Comments
Attachment 7: Public Notice of Scoping Meeting

Attachment 1: Notice of Preparation

Notice of Preparation

Date: September 24, 2013

To: Responsible and Trustee Agencies and Interested Parties

Subject: Notice of Preparation of an Environmental Impact Report

Project: Stockdale Integrated Banking Project

Lead Agency: Rosedale Rio-Bravo Water Storage District

This Notice of Preparation (NOP) has been prepared to notify agencies and interested parties that the Rosedale-Rio Bravo Water Storage District (Rosedale), as the Lead Agency, in consultation with the Irvine Ranch Water District (IRWD), as a Responsible Agency, is beginning preparation of an Environmental Impact Report (EIR) pursuant to the California Environmental Quality Act (CEQA) for the proposed Stockdale Integrated Banking Project (proposed project). The proposed project would allow both agencies to utilize available storage in the local San Joaquin Valley Groundwater Basin by developing groundwater banking facilities on up to three properties located approximately six miles west of the City of Bakersfield in western Kern County. As shown in **Figure 1**, the proposed project would include the Stockdale East property, which is owned by Rosedale, the Stockdale West property, which is owned by IRWD, and a potential third property that would be located within a designated radius around both properties. Operation of the proposed project would be coordinated with Rosedale's existing Groundwater Storage, Banking, Exchange, Extraction & Conjunctive Use Program, which includes the existing Rosedale-IRWD Strand Ranch Integrated Banking Project. The proposed project would provide greater operational flexibility for Rosedale and would enhance water supply reliability for IRWD by providing contingency storage to augment supplies during dry-year periods when other supply sources may be limited or not available. A description of the proposed project and its potential environmental impacts are included as Attachment A to this NOP.

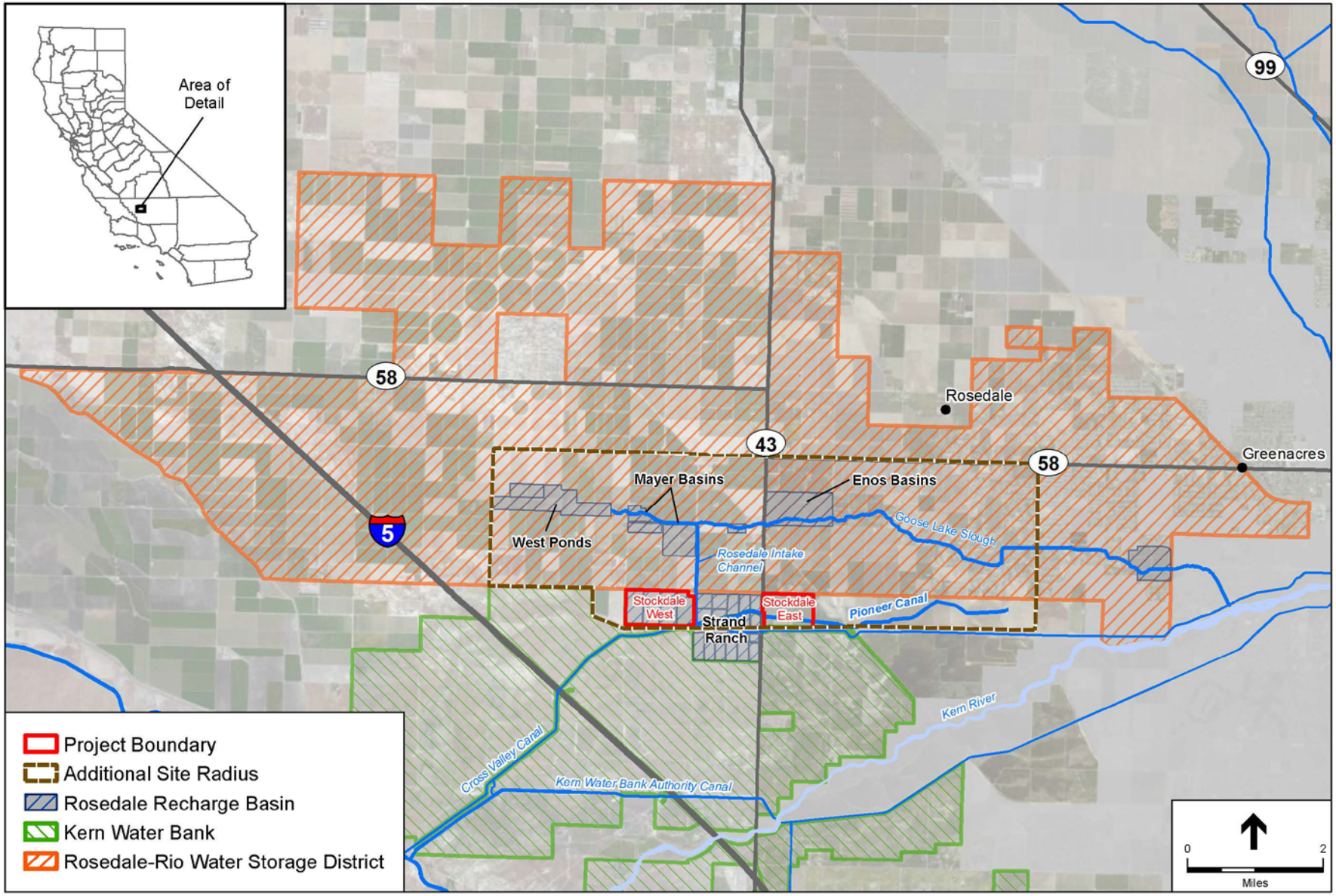
Rosedale and IRWD are soliciting the views of responsible and trustee agencies and interested persons as to the scope and content of the environmental information to be evaluated in the EIR. In accordance with CEQA, agencies are requested to review the project description provided in this NOP and provide comments on environmental issues related to the statutory responsibilities of the agency. The EIR will be used by Rosedale and IRWD when considering approval of the proposed project.

Comment Period. In accordance with the time limits mandated by CEQA, comments on the NOP must be received no later than 30 days after publication of this notice. Please send your comments to the contact person shown below, by **5:00 p.m. on October 24, 2013**. Please include a return address and contact name with your comments.

Contact: Eric Averett
General Manager
Rosedale-Rio Bravo Water Storage District
P.O. Box 20820
Bakersfield, CA 93390-0820
Telephone: (661) 589-6045
Email: eaverett@rrbwsd.com

Scoping Meetings. Two public meetings will be held to receive public comments and suggestions on the project. The scoping meetings will be open to the public as follows:

	Rosedale-Rio Bravo Water Storage District	Irvine Ranch Water District
DATE:	October 16, 2013	October 15, 2013
TIME:	2:00 PM	6:30 PM
LOCATION:	849 Allen Road Bakersfield, California	15600 Sand Canyon Avenue Irvine, California



SOURCE: Bing Maps

Stockdale Integrated Banking Project . 211181

Figure 1

Proposed Project Components

ATTACHMENT A
Stockdale Integrated Banking Project

1. Project Background

Rosedale-Rio Bravo Water Storage District

Rosedale-Rio Bravo Water Storage District (Rosedale) is located west of Bakersfield and encompasses approximately 44,000 acres in Kern County, with 27,500 acres developed as irrigated agriculture and approximately 7,500 acres developed for urban uses. Rosedale's service area overlies the Kern County Sub-Basin of the San Joaquin Valley Groundwater Basin. Rosedale was established in 1959 to develop a groundwater recharge program to offset overdraft conditions in the underlying basin. Rosedale's Groundwater Storage, Banking, Exchange, Extraction & Conjunctive Use Program (Conjunctive Use Program) currently manages approximately 470,000 acre feet (AF) of stored groundwater in the underlying basin, which has an estimated total storage capacity in excess of 1.7 million acre-feet. Water supplies for the Conjunctive Use Program are supplied by the participating water agencies and include high-flow Kern River water and supplies from the Central Valley Project (CVP) and State Water Project (SWP). Currently, the infrastructure for the Conjunctive Use Program includes over one thousand acres of recharge basins and several recovery wells. The current Program provides for maximum annual recharge of approximately 252,000 acre-feet per year (AFY) and maximum annual recovery of approximately 62,500 AFY.

Irvine Ranch Water District

Irvine Ranch Water District (IRWD) was established in 1961 as a California Water District pursuant to the California Water District Law (California Water Code, Division 13). IRWD provides potable and recycled water, sewage collection and treatment, and urban runoff treatment to municipal and industrial (M&I) and agricultural customers within an 115,531-acre service area in Orange County, California. Currently, 65 percent of the water IRWD provides for its customers comes from local sources, including groundwater (produced from the groundwater basin managed by Orange County Water District), surface water, and reclaimed water. The remaining 35 percent of IRWD's water supply is imported by the Metropolitan Water District of Southern California (Metropolitan or MWD) and purchased by IRWD through the Municipal Water District of Orange County (MWDOC).

IRWD currently participates in Rosedale's Conjunctive Use Program through its Strand Ranch Integrated Banking Project (see Figure 1). The Strand Ranch Project includes approximately 502 acres of groundwater recharge basins and seven production wells. IRWD has the ability to

store up to 50,000 AF and to recover 17,500 AFY in accordance with its banking project terms with Rosedale.

2. Project Objectives

The proposed project would allow both Rosedale and IRWD to utilize available storage in the local San Joaquin Valley Groundwater Basin by developing groundwater banking facilities on up to three properties located approximately six miles west of the City of Bakersfield in western Kern County. As shown in **Figure 1**, the proposed project would include the Stockdale East property, which is owned by Rosedale, the Stockdale West property, which is owned by IRWD, and a potential third property that would be located within a designated radius around both properties. The objectives of the proposed project are as follows:

- Integrate the proposed project facilities and coordinate the proposed project operations with Rosedale's Conjunctive Use Program, including the Strand Ranch Integrated Banking Project, to provide for maximum operational flexibility between the various programs and facilities.
- Provide additional groundwater recharge, storage, and recovery capacity in the Kern River Fan region to augment and provide operating flexibility for Rosedale's existing and future programs.
- Develop recharge and recovery capacities for each of IRWD's and Rosedale's respective properties to be available for its priority use and for the other agency's use to the extent not used on an annual basis.
- Develop additional groundwater recharge, storage, and recovery capacity to provide IRWD customers with increased water supply reliability through redundancy and diversification.

3. Purpose and Need for the Project

There is approximately 1.7 million acre-feet (AF) of storage available within the aquifer underlying the Rosedale service area. Rosedale has sufficient storage capacity for its agricultural customers and banking partners and also has considerable unused storage capacity. The proposed project would augment the recharge, storage, and extraction capabilities of the Conjunctive Use Program and provide greater operational flexibility to allow Rosedale to fulfill its mission to maintain groundwater levels within its service area.

In addition, the proposed project would enhance water supply reliability for IRWD by providing contingency storage to augment supplies during dry-year periods when other supply sources may be limited or unavailable. IRWD currently has 50,000 AF of storage associated with the neighboring Strand Ranch Integrated Banking Project (Strand Ranch). IRWD's use of unbalanced exchange programs at Strand Ranch has effectively reduced the amount of storage available to IRWD from 50,000 AF to 25,000 AF. The District desires to maintain a storage capacity of approximately 88,000 AF for its own use, and therefore it is necessary to develop or acquire additional storage and associated recharge and recovery capacity. The proposed project would

augment IRWD's contingency storage allowing it to achieve its storage goals to provide the desired amount of reliability for its water supply portfolio.

Utilizing existing storage capacity in the underlying aquifer avoids the need to construct extensive surface water storage facilities elsewhere to perform the same function. In addition, the proposed project avoids overdraft conditions by eliminating the unbalanced extraction of groundwater for agricultural production. Stockdale East and West are currently not within the boundaries of a public water agency, and thus water extracted historically for agricultural irrigation has not been replenished. The proposed project is consistent with Department of Water Resources (DWR) water management goals. In the *California Water Plan Update 2009*, DWR recognizes the benefits of conjunctive water management, which include improving water supply reliability, reducing groundwater overdraft and land subsidence, and protecting water quality and environmental conditions.

4. Project Location

The proposed project would be located in western Kern County, approximately six miles west of the City of Bakersfield, 10 miles southwest of the Friant-Kern Canal, 2.50 miles south of the City of Shafter, and six miles east of the California Aqueduct (see Figure 1). The project sites would consist of Stockdale East, Stockdale West, and a third property that may be acquired by either agency within a site radius shown in Figure 1 (collectively referred to as the "Stockdale Properties"). Specifically, Stockdale East consists of approximately 230 acres of agricultural land and is located adjacent to and north of the Cross Valley Canal (CVC). Currently the crops grown on Stockdale East are cotton and alfalfa. There is a small pilot groundwater banking facility on Stockdale East as well. Stockdale West consists of approximately 323 acres of land and is located north of the Pioneer Canal and the CVC. Existing conditions at Stockdale West include four recharge basins and one overflow basin that cover 265 acres, built as part of a one-year Pilot Recharge Project in year 2011.

5. Project Description

The proposed project would construct and operate groundwater banking facilities at the Stockdale Properties. Rosedale and IRWD would each retain priority rights to the recharge and recovery capacities identified for their respective properties. Each agency would also retain for their primary use the defined storage capacities associated with their respective properties. Each agency would have equivalent access to available and unused recharge and recovery capacities in each other's facilities not used on an annual basis through each agency's priority rights. In addition to storage capacity tied to Stockdale West, IRWD also would have access to an additional 50,000 AF of storage in Rosedale's Conjunctive Use Program under a proposed Program Agreement between Rosedale and IRWD.

The proposed project would integrate facilities at the Stockdale Properties with Rosedale's existing Conjunctive Use Program and the Strand Ranch Integrated Banking Project. The proposed project would allow for coordinated operation of recharge and recovery facilities at the Stockdale Properties with the Strand Ranch and Conjunctive Use Programs. Rosedale may

provide IRWD access to unused recharge and recovery capacity from its Conjunctive Use Program subject to the annual recharge and recovery limits previously analyzed in accordance with CEQA. The Conjunctive Use Program and Strand Ranch facilities have already been evaluated in accordance with CEQA.

Water Supplies

Source waters for recharge would be secured and acquired by Rosedale and IRWD from various sources, including federal, state, and local suppliers through unbalanced exchange agreements, purchase, temporary transfers, permanent transfers or other water exchange and management programs as may be developed. Specifically, water supply sources could include, but are not limited to, the State Water Project (SWP), the Kern River, and Central Valley Project (CVP).

Recharge Facilities

In 2011, IRWD constructed four recharge basins and one overspill containment basin on the Stockdale West property as part of the one-year Pilot Recharge Project. The Pilot Recharge Project facilities include basins and earthen berms consisting of varying shape, size and depth covering 265 acres (or 82 percent) of the property. The existing basin layout avoids the edges of the Pioneer Canal and the CVC. The proposed project would utilize the existing recharge basins on Stockdale West. No other recharge basins would be constructed on Stockdale West. However, embankments may be constructed to divide the existing basins into smaller impoundments as may be necessary in the future.

Stockdale East currently has small pilot groundwater banking facilities onsite. The proposed project would construct new recharge and conveyance facilities on the Stockdale East property, including basins and berms that would occupy approximately 200 acres (or 87 percent) of the property. Recharge facilities would consist of up to eight recharge basins of varying shape, size, and depth. The third Stockdale Property also may be developed with new recharge facilities, similar to those described for Stockdale East and Stockdale West. It is anticipated that recharge capacity at the third property would be comparable to neighboring banking projects.

Recharge basins and conveyance facilities at the Stockdale Properties would be constructed, operated and maintained in a manner to prevent high groundwater conditions that would impact CVC operations. It is anticipated that a groundwater monitoring program, similar to that developed for the Kern Water Bank Authority and Strand Ranch, would be developed for the proposed project.

Extraction Facilities

The proposed recovery facilities at all three Stockdale Properties would be designed to minimize impacts to wells pumping on adjacent properties. Recovery capacity and the number of wells to be constructed at the Stockdale Properties will be determined based on modeling of specific subsurface conditions at each site. IRWD will reserve priority use of all recovery facilities and capacities located on the Stockdale West property while Rosedale will reserve priority use of the recovery facilities and capacities located on the Stockdale East property.

Similar to the Strand Ranch Project, the proposed project would provide flexibility for IRWD and Rosedale to pump from existing off-site wells within Rosedale's service area when unused capacity is available. In addition, the proposed project includes the opportunity for IRWD and Rosedale to construct and pump from up to three new additional wells within the Rosedale service area. These wells would be joint-use wells providing recovery capacity for both agencies in support of the proposed project or to meet other recovery obligations. The proposed project would provide the flexibility to combine the use of the wells on the Stockdale Properties with these joint-use wells to meet pumping obligations.

Conveyance Facilities

Water would be conveyed to the proposed project via the CVC and Rosedale's Intake Channel. In addition, other regional facilities may be used to move water to/from the project, such as the Pioneer Canal, subject to any necessary approvals.

Water could be conveyed to Stockdale West through the existing Strand Ranch facility using an existing siphon and intake structure that connects the two properties. This conveyance strategy would utilize the existing CVC Strand Ranch North Turnout, and water would flow by gravity to Stockdale West. Additional improvements to the Rosedale Intake Channel or CVC turnouts may be modified or constructed to improve the ability to deliver water to Stockdale West.

Water could be conveyed to Stockdale East via the CVC and other regional facilities, such as the Pioneer Canal. Water could be conveyed to the Pioneer Canal through existing turnouts from the Strand Ranch Canal or the CVC. A new turnout or turnouts from the CVC and/or the Pioneer Canal to the Stockdale East Property may also be constructed. A low head lift station would be constructed to lift the water the few feet necessary to recharge on portions of the property.

Groundwater recovered from the production wells on Stockdale East and Stockdale West would be conveyed to the CVC through new recovery pipelines that would be below ground, running along the dirt roads between recharge basins or buried in the basin bottoms, with exact locations subject to final well placement. The recovery pipelines could connect to the Rosedale Intake Channel and/or the CVC. Groundwater recovered from the three off-site wells within Rosedale's service area also would be conveyed to the CVC through new or existing pipelines that would connect to the Rosedale Intake Channel. Construction and operation of these off-site recovery pipelines have already been evaluated in accordance with CEQA as part of Rosedale's Conjunctive Use Program.

6. Discussion of Impacts

In accordance with Section 15126 of the CEQA Guidelines, the EIR will assess the physical changes to the environment that would likely result from construction and operation of the proposed project, including direct, indirect and cumulative impacts and growth-inducing impacts. The EIR will provide an assessment of impacts at the project level for facilities and activities associated with Stockdale East and Stockdale West (CEQA Guidelines Section 15161) and at the program level for facilities and activities associated with the third Stockdale Property (CEQA Guidelines Section 15168). A subsequent assessment of impacts would be required in accordance

with CEQA prior to implementation of project facilities at the third Stockdale Property, once the location and project design have been identified.

Potential impacts of the proposed project are summarized below. The EIR will identify mitigation measures if necessary to reduce potentially significant impacts of the proposed project. The EIR also will discuss alternatives to the proposed project, including the no-project alternative.

Aesthetics

The existing aesthetic quality of the project area is dominated by rural agriculture. The proposed project would alter the visual character of the project sites and their surroundings by converting agricultural land uses to groundwater banking land uses. The EIR will evaluate the potential for the proposed project to impact aesthetic resources, including visual character, scenic vistas, and new sources of light and glare.

Agricultural Resources

The proposed project would increase the amount and reliability of groundwater supplies available for irrigated agriculture in the region and contribute beneficially to agricultural production. When not being used for groundwater recharge, the properties may be maintained by either grazing or irrigated agricultural activities. The EIR will determine if the Stockdale Properties include lands designated by the state's Farmland Mapping and Monitoring Program as Prime, Unique, or Important Farmland and if the project sites are located within Kern County agricultural preserves or under Williamson Act contracts. If necessary, mitigation measures will be developed to reduce impacts to agricultural resources.

Air Quality

Construction of the proposed project would generate emissions from construction equipment exhaust, earth movement, construction workers' commute, and material hauling. The EIR will estimate construction related emissions and long-term operational emissions of the proposed project. The EIR will also evaluate the proposed project's consistency with the regional air quality attainment plans. The EIR will develop mitigation measures if necessary to reduce impacts associated with the project.

Biological Resources

The proposed project is located on and surrounded by agricultural lands; natural habitat in the immediate vicinity is limited. The EIR will evaluate the potential for the proposed project to impact biological resources, such as sensitive species and critical habitats, and will evaluate the project's consistency with the Metropolitan Bakersfield Habitat Conservation Plan (HCP), Kern Water Bank HCP, local ordinances, and state and federal regulations governing biological resources.

Cultural Resources

Although the Stockdale Properties would be located in disturbed areas primarily used for agricultural production, excavation below the top soil could uncover previously unknown archaeological or paleontological resources. Historic resources also may exist in the area. The

EIR will assess the potential effects of the proposed project on cultural resources. Mitigation measures will be developed if necessary to reduce the level of impact where possible.

Geology, Soils, and Seismicity

The proposed project is located in a seismically active region. New project facilities could be subject to potential seismic hazards including ground shaking. In addition, ground-disturbing construction activities could expose soils to storm water erosion. The EIR will evaluate geologic hazards in the region and will develop mitigation measures if necessary to reduce potential effects of the proposed project.

Greenhouse Gas Emissions

Construction activities would require operation of equipment and vehicles that emit greenhouse gases (GHGs). Project facilities would be operated with electric power, the generation of which produces GHGs. The EIR will quantify GHG emissions associated with project construction and operation in terms of carbon dioxide equivalent (CO2e) emissions and compare project emissions to regional thresholds of significance. The analysis will consider the collective size of project facilities with respect to levels of CO2e emissions and the energy efficiency parameters of the project.

Hazards and Hazardous Materials

Construction of new project facilities would require excavation of the existing ground surface, which could uncover contaminated soils or hazardous substances that pose a substantial hazard to human health or the environment. The EIR will assess the potential for encountering hazardous materials and conditions and will develop mitigation measures if necessary to ensure that any hazards encountered during construction would be handled in accordance with applicable regulations. The EIR will also assess the potential for the public or the environment to be affected by accidental release of hazardous materials due to project construction and operation and will develop mitigation measures if necessary to minimize potential effects. Operation of groundwater recharge basins could mobilize existing soil contamination. The EIR will assess the potential for project operations to affect the location of contamination plumes and subsequently affect groundwater quality.

Hydrology and Water Quality

The EIR will identify surface water and groundwater resources in the vicinity of the Stockdale Properties and will evaluate potential impacts posed by the project during construction and operation. The EIR will describe the recharge, storage, and recovery capacities of Stockdale East and Stockdale West and model potential impacts of recharge and extraction activities both onsite and offsite. The EIR will summarize the results of a groundwater drawdown analysis for proposed production well operations and a mounding analysis for proposed recharge operations. Cumulative impacts of operating the proposed project will include an assessment of incremental impacts to groundwater due to coordinated operation of the project facilities and facilities associated with the Conjunctive Use Program and Strand Ranch Project, and any other neighboring groundwater recharge or recovery facilities.

The EIR will also provide existing groundwater quality data, analyze the differential project impacts to water quality based on source waters, and analyze the impact of project operations on any nearby groundwater contamination plumes. In addition, the EIR also will describe potential impacts associated with storm water runoff and develop mitigation measures if necessary to meet construction and operational storm water quality requirements and minimize impacts to receiving waters.

Land Use

The proposed project would be located in a rural area of Kern County. The EIR will identify the designated land uses for the Stockdale Properties. The EIR will evaluate consistency of the proposed project with existing land uses within the project area and develop mitigation measures to avoid inconsistencies if necessary.

Mineral Resources

Petroleum resources and oil production facilities are present in the western portion of Kern County where the proposed project would be located. Stockdale East currently has three operating oil wells with pumping units, one tank farm, one produced water injection well, three idle, and two plugged wellheads onsite. The status of oil operations will be described in the EIR. The EIR will identify impacts to mineral resources that would result from implementation of the proposed project and develop mitigation measures to avoid or substantially lessen impacts, if necessary.

Noise

Construction of the proposed project would generate noise that could be audible by nearby residents and other sensitive receptors in the vicinity of the Stockdale Properties. The EIR will evaluate the proximity of sensitive receptors to the project sites and recommend mitigation measures if necessary to ensure that the proposed project complies with local policies and ordinances and minimizes noise impacts.

Transportation and Traffic

Construction of the proposed project would temporarily add additional vehicle trips to local transportation corridors, including material haul trips and construction worker commutes. The EIR will evaluate the impact of the proposed project on traffic and circulation in the vicinity of the project sites and local and regional roadways. The EIR will develop mitigation measures if necessary to minimize any potential effects.

Utilities and Energy

Construction and operation of the proposed project could affect public utilities and regional energy requirements. The EIR will describe any potential need for water entitlements to operate the proposed project and identify potential impacts to local and regional energy supplies and capacity due to operation of pumps and wellheads. The EIR also will describe any potential impacts on storm water drainage systems and solid waste facilities, including regional landfill capacities and availability to accept construction debris.

Notice of Preparation

Date: September 24, 2013

To: Responsible and Trustee Agencies and Interested Parties

Subject: Notice of Preparation of an Environmental Impact Report

Project: Stockdale Integrated Banking Project

Lead Agency: Rosedale Rio-Bravo Water Storage District

This Notice of Preparation (NOP) has been prepared to notify agencies and interested parties that the Rosedale-Rio Bravo Water Storage District (Rosedale), as the Lead Agency, in consultation with the Irvine Ranch Water District (IRWD), as a Responsible Agency, is beginning preparation of an Environmental Impact Report (EIR) pursuant to the California Environmental Quality Act (CEQA) for the proposed Stockdale Integrated Banking Project (proposed project). The proposed project would allow both agencies to utilize available storage in the local San Joaquin Valley Groundwater Basin by developing groundwater banking facilities on up to three properties located approximately six miles west of the City of Bakersfield in western Kern County. As shown in **Figure 1**, the proposed project would include the Stockdale East property, which is owned by Rosedale, the Stockdale West property, which is owned by IRWD, and a potential third property that would be located within a designated radius around both properties. Operation of the proposed project would be coordinated with Rosedale's existing Groundwater Storage, Banking, Exchange, Extraction & Conjunctive Use Program, which includes the existing Rosedale-IRWD Strand Ranch Integrated Banking Project. The proposed project would provide greater operational flexibility for Rosedale and would enhance water supply reliability for IRWD by providing contingency storage to augment supplies during dry-year periods when other supply sources may be limited or not available. A description of the proposed project and its potential environmental impacts are included as Attachment A to this NOP.

Rosedale and IRWD are soliciting the views of responsible and trustee agencies and interested persons as to the scope and content of the environmental information to be evaluated in the EIR. In accordance with CEQA, agencies are requested to review the project description provided in this NOP and provide comments on environmental issues related to the statutory responsibilities of the agency. The EIR will be used by Rosedale and IRWD when considering approval of the proposed project.

Comment Period. In accordance with the time limits mandated by CEQA, comments on the NOP must be received no later than 30 days after publication of this notice. Please send your comments to the contact person shown below, by **5:00 p.m. on October 24, 2013**. Please include a return address and contact name with your comments.

Contact: Eric Averett
General Manager
Rosedale-Rio Bravo Water Storage District
P.O. Box 20820
Bakersfield, CA 93390-0820
Telephone: (661) 589-6045
Email: eaverett@rrbwsd.com

Scoping Meetings. Two public meetings will be held to receive public comments and suggestions on the project. The scoping meetings will be open to the public as follows:

	Rosedale-Rio Bravo Water Storage District	Irvine Ranch Water District
DATE:	October 16, 2013	October 15, 2013
TIME:	2:00 PM	6:30 PM
LOCATION:	849 Allen Road Bakersfield, California	15600 Sand Canyon Avenue Irvine, California

3076

Notice of Preparation

POSTED

SEP 24 2013

ORANGE COUNTY CLERK-RECORDER DEPARTMENT

BY: _____ DEPUTY

Date: September 24, 2013

To: Responsible and Trustee Agencies and Interested Parties

Subject: Notice of Preparation of an Environmental Impact Report

Project: Stockdale Integrated Banking Project

Lead Agency: Rosedale Rio-Bravo Water Storage District

This Notice of Preparation (NOP) has been prepared to notify agencies and interested parties that the Rosedale-Rio Bravo Water Storage District (Rosedale), as the Lead Agency, in consultation with the Irvine Ranch Water District (IRWD), as a Responsible Agency, is beginning preparation of an Environmental Impact Report (EIR) pursuant to the California Environmental Quality Act (CEQA) for the proposed Stockdale Integrated Banking Project (proposed project). The proposed project would allow both agencies to utilize available storage in the local San Joaquin Valley Groundwater Basin by developing groundwater banking facilities on up to three properties located approximately six miles west of the City of Bakersfield in western Kern County. As shown in **Figure 1**, the proposed project would include the Stockdale East property, which is owned by Rosedale, the Stockdale West property, which is owned by IRWD, and a potential third property that would be located within a designated radius around both properties. Operation of the proposed project would be coordinated with Rosedale's existing Groundwater Storage, Banking, Exchange, Extraction & Conjunctive Use Program, which includes the existing Rosedale-IRWD Strand Ranch Integrated Banking Project. The proposed project would provide greater operational flexibility for Rosedale and would enhance water supply reliability for IRWD by providing contingency storage to augment supplies during dry-year periods when other supply sources may be limited or not available. A description of the proposed project and its potential environmental impacts are included as Attachment A to this NOP.

Rosedale and IRWD are soliciting the views of responsible and trustee agencies and interested persons as to the scope and content of the environmental information to be evaluated in the EIR. In accordance with CEQA, agencies are requested to review the project description provided in this NOP and provide comments on environmental issues related to the statutory responsibilities of the agency. The EIR will be used by Rosedale and IRWD when considering approval of the proposed project.

Comment Period. In accordance with the time limits mandated by CEQA, comments on the NOP must be received no later than 30 days after publication of this notice. Please send your comments to the contact person shown below, by **5:00 p.m. on October 24, 2013**. Please include a return address and contact name with your comments.

Contact: Eric Averett
General Manager
Rosedale-Rio Bravo Water Storage District
P.O. Box 20820
Bakersfield, CA 93390-0820
Telephone: (661) 589-6045
Email: eaverett@rrbwsd.com

Scoping Meetings. Two public meetings will be held to receive public comments and suggestions on the project. The scoping meetings will be open to the public as follows:

	Rosedale-Rio Bravo Water Storage District	Irvine Ranch Water District
DATE:	October 16, 2013	October 15, 2013
TIME:	2:00 PM	6:30 PM
LOCATION:	849 Allen Road Bakersfield, California	15600 Sand Canyon Avenue Irvine, California

Attachment 2: Notice of Completion

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH #

Project Title: Stockdale Integrated Banking Project

Lead Agency: Rosedale-Rio Bravo Water Storage District | Contact Person: Eric Averett
Mailing Address: 849 Allen Road | Phone: (661) 589-6045
City: Bakersfield | Zip: 93390-0820 | County: Kern County

Project Location: County: Kern | City/Nearest Community: Rosedale
Cross Streets: Stockdale Hwy & Enos Lane (Hwy 43) | Zip Code: 93312
Longitude/Latitude (degrees, minutes and seconds): ____° ____' ____" N / ____° ____' ____" W Total Acres: ____
Assessor's Parcel No.: ____ Section: ____ Twp.: ____ Range: ____ Base: ____
Within 2 Miles: State Hwy #: 58, 43, 119 | Waterways: Kern River, Cross Valley Canal, Pioneer Canal
Airports: ____ | Railways: Santa Fe Railroad | Schools: ____

Document Type:

CEQA: ☑ NOP ☐ Draft EIR ☐ Supplement/Subsequent EIR (Prior SCH No.) ____ ☐ Early Cons ☐ Neg Dec ☐ Mit Neg Dec Other: ____
NEPA: ☐ NOI ☐ EA ☐ Draft EIS ☐ FONSI
Other: ☐ Joint Document ☐ Final Document ☐ Other: ____

Local Action Type:

☐ General Plan Update ☐ General Plan Amendment ☐ General Plan Element ☐ Community Plan
☐ Specific Plan ☐ Master Plan ☐ Planned Unit Development ☐ Site Plan
☐ Rezone ☐ Prezone ☐ Use Permit ☐ Land Division (Subdivision, etc.)
☐ Annexation ☐ Redevelopment ☐ Coastal Permit ☐ Other: ____

Development Type:

☐ Residential: Units ____ Acres ____
☐ Office: Sq.ft. ____ Acres ____ Employees ____
☐ Commercial: Sq.ft. ____ Acres ____ Employees ____
☐ Industrial: Sq.ft. ____ Acres ____ Employees ____
☐ Educational: ____
☐ Recreational: ____
☑ Water Facilities: Type recharge & wells MGD ____
☐ Transportation: Type ____
☐ Mining: Mineral ____
☐ Power: Type ____ MW ____
☐ Waste Treatment: Type ____ MGD ____
☐ Hazardous Waste: Type ____
☐ Other: ____

Project Issues Discussed in Document:

☑ Aesthetic/Visual ☑ Agricultural Land ☑ Air Quality ☑ Archeological/Historical ☑ Biological Resources ☐ Coastal Zone ☑ Drainage/Absorption ☐ Economic/Jobs
☐ Fiscal ☑ Flood Plain/Flooding ☐ Forest Land/Fire Hazard ☑ Geologic/Seismic ☑ Minerals ☑ Noise ☐ Population/Housing Balance ☐ Public Services/Facilities
☐ Recreation/Parks ☐ Schools/Universities ☐ Septic Systems ☐ Sewer Capacity ☑ Soil Erosion/Compaction/Grading ☑ Solid Waste ☑ Toxic/Hazardous ☑ Traffic/Circulation
☐ Vegetation ☑ Water Quality ☑ Water Supply/Groundwater ☐ Wetland/Riparian ☑ Growth Inducement ☑ Land Use ☑ Cumulative Effects ☐ Other: ____

Present Land Use/Zoning/General Plan Designation:

Stockdale East - Intensive Agriculture; Exclusive Agriculture. Stockdale West - Intensive Agriculture; Exclusive Agriculture.

Project Description: *(please use a separate page if necessary)*

The Rosedale-Rio Bravo Water Storage District (Rosedale), as the Lead Agency, in consultation with the Irvine Ranch Water District (IRWD), as the Responsible Agency, proposes the Stockdale Integrated Banking Project. The proposed project would be located on three properties in the vicinity of Stockdale Highway and Enos Lane (Hwy 43). The proposed project would develop groundwater banking facilities, including recharge basins and groundwater production wells, on the three properties. The proposed project would augment the recharge and extraction capacity of Rosedale's existing Conjunctive Use Program and provide greater operational flexibility. The proposed project would also enhance water supply reliability for IRWD by providing contingency storage to augment supplies during dry-year periods when other supply sources may be limited or not available.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "**X**".
If you have already sent your document to the agency please denote that with an "**S**".

X	Air Resources Board	X	Office of Emergency Services
	Boating & Waterways, Department of	X	Office of Historic Preservation
	California Highway Patrol		Office of Public School Construction
X	Caltrans District # 6		Parks & Recreation, Department of
	Caltrans Division of Aeronautics		Pesticide Regulation, Department of
	Caltrans Planning		Public Utilities Commission
	Central Valley Flood Protection Board	X	Regional WQCB # 5
	Coachella Valley Mtns. Conservancy	X	Resources Agency
	Coastal Commission		S.F. Bay Conservation & Development Comm.
	Colorado River Board		San Gabriel & Lower L.A. Rivers & Mtns. Conservancy
X	Conservation, Department of		San Joaquin River Conservancy
	Corrections, Department of		Santa Monica Mtns. Conservancy
	Delta Protection Commission		State Lands Commission
	Education, Department of		SWRCB: Clean Water Grants
	Energy Commission	X	SWRCB: Water Quality
X	Fish & Game Region # 4		SWRCB: Water Rights
	Food & Agriculture, Department of		Tahoe Regional Planning Agency
	Forestry and Fire Protection, Department of	X	Toxic Substances Control, Department of
	General Services, Department of	X	Water Resources, Department of
X	Health Services, Department of		
	Housing & Community Development		Other:
	Integrated Waste Management Board		Other:
X	Native American Heritage Commission		

Local Public Review Period (to be filled in by lead agency)

Starting Date September 24, 2013 Ending Date October 24, 2013

Lead Agency (Complete if applicable):

Consulting Firm: ESA
Address: 626 Wilshire Blvd, Suite 1100
City/State/Zip: Los Angeles, CA 90017
Contact: Jennifer Jacobus
Phone: (213) 599-4300

Applicant:
Address:
City/State/Zip:
Phone:

Signature of Lead Agency Representative: _____ **Date:** 9/23/13

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

Stockdale Integrated Banking Project

SCH Number: 2013091076

Document Type: NOP - Notice of Preparation

Project Lead Agency: Rosedale-Rio Bravo Water Storage District

Project Description

The Rosedale-Rio Bravo Water Storage District, as the Lead Agency, in consultation with the Irvine Ranch Water District (IRWD), as the Responsible Agency, proposes the Stockdale Integrated Banking Project. The proposed project would be located on three properties in the vicinity of Stockdale Highway and Enos Lane (Hwy 43). The proposed project would develop groundwater banking facilities, including recharge basins and groundwater production wells, on the three properties. The proposed project would augment the recharge and extraction capacity of Rosedale's existing Conjunctive Use Program and provide greater operational flexibility. The proposed project would also enhance water supply reliability for IRWD by providing contingency storage to augment supplies during dry-year periods when other supply sources may be limited or not available.

Contact Information

Primary Contact:
Eric Averett
Rosedale-Rio Bravo Water Storage District
661/589-6045
849 Allen Road
P.O. Box 867
Bakersfield, CA 93302-0867

Project Location

County: Kern
City:
Region:
Cross Streets: Stockdale Hwy & Enos Lane (Hwy 43)
Latitude/Longitude:
Parcel No:
Township:
Range:
Section:
Base:
Other Location Info: Rosedale

Proximity To

Highways: Hwy 58, 43, 119
Airports:
Railways: Santa Fe Railroad
Waterways: Kern River, Cross Valley Canal, Pioneer Canal
Schools:
Land Use: Stockdale East - Intensive Agriculture; Exclusive Agriculture. Stockdale West - Intensive Agriculture; Exclusive Agriculture.

Development Type

Water Facilities

Local Action

Project Issues

Aesthetic/Visual, Agricultural Land, Air Quality, Archaeologic-Historic, Biological Resources, Drainage/Absorption, Flood Plain/Flooding, Geologic/Seismic, Minerals, Noise, Soil Erosion/Compaction/Grading, Solid Waste, Toxic/Hazardous, Traffic/Circulation, Water Quality, Water Supply, Growth Inducing, Landuse, Cumulative Effects

Reviewing Agencies (Agencies in **Bold Type** submitted comment letters to the State Clearinghouse)

Resources Agency; Department of Parks and Recreation; Department of Water Resources; Department of Fish and Wildlife, Region 4; CA Department of Public Health; Native American Heritage Commission; Public Utilities Commission; California Highway Patrol; Caltrans, District 6; State Water Resources Control Board, Divison of Financial Assistance; State Water Resources Control Board, Division of Water Quality; State Water Resources Control Board, Division of Water Rights; Regional Water Quality Control Bd., Region 5 (Fresno)

Date Received: 9/24/2013 **Start of Review:** 9/24/2013 **End of Review:** 10/23/2013

CEQAnet HOME | NEW SEARCH

Attachment 3: Scoping Meeting Presentation

Stockdale Integrated Banking Project

CEQA SCOPING MEETINGS

October 15 and 16, 2013

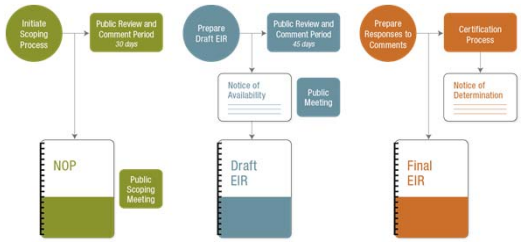
ESA is where solutions and service meet.

Purpose of Meeting & Agenda

- Purpose of Meeting
  - Provide an opportunity for agencies and interested persons to provide input regarding the scope and content of environmental information to be evaluated in the Draft Environmental Impact Report (EIR)
- Agenda
  - California Environmental Quality Act (CEQA) Overview and Process
  - Project Background
  - Project Description
  - Project Objectives
  - Issues Analyzed in the EIR
  - CEQA Schedule for Project
  - Receive Public Comments

California Environmental Quality Act

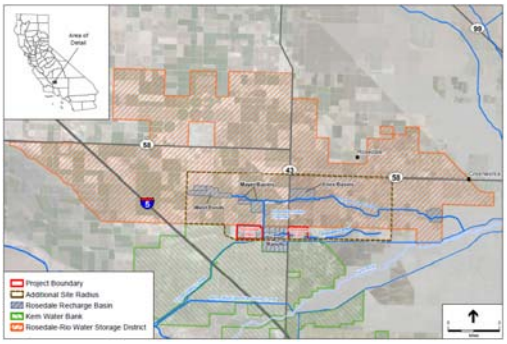
CEQA Process for an EIR



Rosedale-Rio Bravo Water Storage District

- Established in 1959 to develop a groundwater recharge program to offset overdraft conditions in the underlying San Joaquin Valley Groundwater Basin.
- Service Area
  - 44,000 acres west of Bakersfield
  - 27,500 acres irrigated agriculture; 7,500 acres urban uses
- Groundwater Storage, Banking, Exchange, Extraction & Conjunctive Use Program
  - Total storage capacity in excess of ~1.7 million AF
  - Annual recharge of ~252,000 AFY
  - Maximum annual recovery ~62,500 AFY
  - Over 1,000 acres of recharge basins

Rosedale-Rio Bravo Water Storage District



Irvine Ranch Water District

- Established in 1961, IRWD provides potable and recycled water, sewage collection and treatment, and urban runoff treatment.
- Service Area
  - 115,531 acres in Orange County, including all of the City of Irvine and portions of the Cities of Costa Mesa, Lake Forest, Newport Beach, Orange, Santa Ana, Tustin, and unincorporated Orange County
- Strand Ranch Integrated Banking Project:
  - IRWD participates in Rosedale's Conjunctive Use Program
  - 502 acres of recharge basins / 7 production wells
  - 50,000 AF storage limit / 17,500 AFY recovery limit

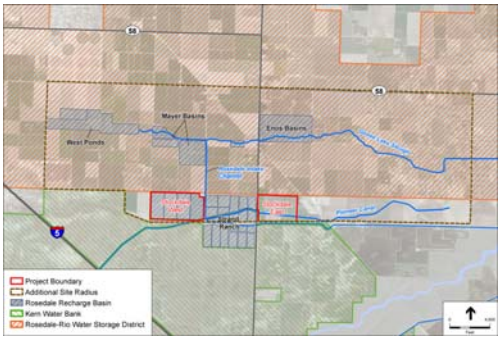
Stockdale Integrated Banking Project

- The proposed project would allow both Rosedale and IRWD to utilize available storage in the local San Joaquin Valley Groundwater Basin by developing groundwater banking facilities on the Stockdale Properties:
  - Stockdale East – Rosedale
  - Stockdale West – IRWD
  - Third property within a designated site radius
- Project facilities include new recharge basins, extraction wells, conveyance facilities

Stockdale Integrated Banking Project

- Rosedale and IRWD retain priority rights to recharge and recovery capacities for their own properties.
- Equivalent access to available and unused recharge and recovery capacities in each other's facilities.
- Integration of project facilities with the Conjunctive Use Program and Strand Ranch Project.
- Coordinated operation of project facilities with the Conjunctive Use Program and Strand Ranch Project.

Stockdale Integrated Banking Project



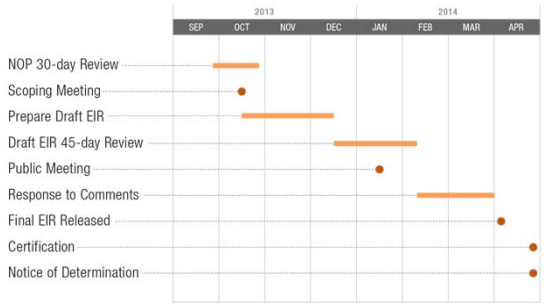
Stockdale Project Objectives

- Integrate the proposed project facilities and coordinate the proposed project operations with Rosedale's Conjunctive Use Program, including the Strand Ranch Integrated Banking Project, to provide for maximum operational flexibility between the various programs and facilities.
- Provide additional groundwater recharge, storage, and recovery capacity in the Kern River Fan region to augment and provide operating flexibility for Rosedale's existing and future programs.
- Develop recharge and recovery capacities for each of IRWD's and Rosedale's respective properties to be available for its priority use and for the other agency's use to the extent not used on an annual basis.
- Develop additional groundwater recharge, storage, and recovery capacity to provide IRWD customers with increased water supply reliability through redundancy and diversification.

Issues Analyzed in the EIR

- Aesthetics
- Agriculture & Forestry
- Air Quality & GHG
- Biological Resources
- Cultural Resources
- Geology, Soils, & Seismicity
- Hazards &Hazardous Materials
- Hydrology &Water Quality
- Land Use & Recreation
- Mineral Resources
- Noise
- Public Services
- Transportation and Traffic
- Utilities and Energy
- Alternatives Analysis
- Cumulative Impacts
- Growth Inducement

Estimated CEQA Schedule



NOP Review and Comment

- Please send comments to:

Eric Averett, General Manager
Rosedale-Rio Bravo Water Storage District
P.O. Box 20820
Bakersfield, CA 93390-0820
eaverett@rrbwsd.com

- Written comments must be received by:

5:00 PM on October 24, 2013

- Include contact information with all comments
- NOP document availability: **www.irwd.com**

Public Comments

Attachment 4: Scoping Meeting Sign-in Sheets

Sign-in Sheet

Irvine Ranch Water District
15600 Canyon Avenue, Irvine, CA
Tuesday, October 15, 2013 | 6:30pm

Rosedale Rio-Bravo Water Storage District
849 Allen Road, Bakersfield, CA
Wednesday, October 16, 2013 | 2:00pm

The signing, registering, or completion of this document is voluntary. All persons may attend this meeting regardless of whether they sign, register, or complete this document.

Name: DEE JASPAR
Company/Affiliation: DEE JASPAR & ASSOC, INC
Address: 2730 UNICORN RD. BLDG "A"
BAKERSFIELD CA 93308
Email: djaspar@djaciv1.com
Do you want future notices regarding this project? ☐ yes ☐ no

Name:
Company/Affiliation:
Address:
Email:
Do you want future notices regarding this project? ☐ yes ☐ no

Name: Stephen Reich
Company/Affiliation: Stetson Engineers
Address: 2171 Francisco Blvd. E.
San Rafael, CA 94901
Email: Steverc@stetsonengineers.com.
Do you want future notices regarding this project? ☒ yes ☐ no

Name:
Company/Affiliation:
Address:
Email:
Do you want future notices regarding this project? ☐ yes ☐ no

Name:
Company/Affiliation:
Address:
Email:
Do you want future notices regarding this project? ☐ yes ☐ no

Name:
Company/Affiliation:
Address:
Email:
Do you want future notices regarding this project? ☐ yes ☐ no

Name:
Company/Affiliation:
Address:
Email:
Do you want future notices regarding this project? ☐ yes ☐ no

Name:
Company/Affiliation:
Address:
Email:
Do you want future notices regarding this project? ☐ yes ☐ no

Attachment 5: Comment Letters Received by Rosedale

Date 10-23-13 SH
File Name
File Location
Original Section 1 EIR
Copy
Scan
Email

ARVIN-EDISON WATER STORAGE DISTRICT

October 22, 2013

Eric Averett, General Manager
Rosedale-Rio Bravo Water Storage District
P.O. Box 20820
Bakersfield, CA 93390-0820

Re: *Stockdale Integrated Banking Project NOP Comments*

Dear Mr. Averett:

Thank you for providing Arvin-Edison Water Storage District (AEWSD) the opportunity to comment on the Rosedale-Rio Bravo Water Storage District (RRBWSD) and Irvine Ranch Water District's Notice of Preparation (NOP) of an Environmental Impact Report (EIR) regarding the Stockdale Integrated Banking Project (Project).

AEWSD is generally supportive of groundwater banking programs and projects. As you are aware, AEWSD also has a long-term water management program/agreement with RRBWSD and values the relationship.

AEWSD's primary concern is with respect to water quality. This Project anticipates discharging native groundwater into the Cross Valley Canal (CVC). Currently there is no water quality policy on the CVC, which would address, among other things, potential degradation of CVC supplies. Accordingly, the Project cannot point to existing requirements and operational guidelines to limit degradation; and therefore, limit any water quality impacts from the Project. Subsequently, the EIR will need to address potential degradation of receiving water supplies and subsequent mitigation needs, if any.

Thank you, and again we appreciate the opportunity to provide input into your Project. If you have questions or comments, please don't hesitate to call or email.

Sincerely,

Steve Collup
Engineer-Manager

cc: Jeevan Muhar, Staff Engineer
Holly Melton, KCWA/CVC

SCC:JSM:sj\AEWSD\RRBWSD\Averett.Eric.NOP.comments.SIBP.10.13.doc

20401 Bear Mountain Boulevard · P.O. Box 175 · Arvin, CA 93203
Telephone (661) 854-5573 · Fax (661) 854-5213 · E-mail: arvined@aewsd.org

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Central Region
1234 East Shaw Avenue
Fresno, CA 93710
(559) 243-4005
www.wildlife.ca.gov

EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director

Date 10-28-13 JH
File Name
File Location
Original Section I EIR
Copy
Scan
Email

October 23, 2013

Eric Averett
Rosedale-Rio Bravo Water Storage District
Post Office Box 20820
Bakersfield, California 93390-0820

SUBJECT: NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT STOCKDALE INTEGRATED BANKING PROJECT ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT SCH# 2013091076

Dear Mr. Averett:

The California Department of Fish and Wildlife (Department) has reviewed the Notice of Preparation (NOP) prepared for the above Project. Approval of the Project would result in the development of a groundwater banking facility which would include recharge basins and groundwater extraction wells. The proposed Project would augment the recharge and extraction capacity of the Rosedale's existing Conjunctive Use Program and provide greater operational flexibility. The Project would also enhance water supply reliability for the Irvine Ranch Water District (IRWD) by providing contingency storage to augment supplies during dry-year periods when other supply sources may be limited or not available.

The Project site is located on three properties in the vicinity of Stockdale Highway and Enos Lane (Highway 43), ten miles southwest of the Friant-Kern Canal, 2.5 miles south of the City of Shafter, and six miles east the California Aqueduct in western Kern County, California. Based on the information provided, it appears that the Project will occur on three potential properties including Stockdale East, owned by the Rosedale-Rio Bravo Water Storage District; Stockdale West, owned by the IRWD, and a potential third property that would be located within a radius around both properties. Stockdale East currently consists of 230 acres of cotton and alfalfa, and it is adjacent to and north of the Cross Valley Canal. Stockdale West includes 323 acres of land north of Pioneer Canal and Cross Valley Canal, and consists of four recharge basins and one overflow basin. The third property consisting of the radius around Stockdale East and West, has yet to be defined.

The Department recognizes that the Lead Agency will evaluate the potential for the Project to impact biological resources within the Environmental Impact Report (EIR). The NOP states, "the proposed project is located on and surrounded by agricultural

lands; natural habitat in the immediate vicinity is limited." Based on the current aerial imagery available, dated July 30, 2012, the study area includes parcels containing non-native grassland that offers habitat opportunities for special status species. This letter is to provide early guidance to assist the Lead Agency and the Project biologist regarding our concerns. The Department is concerned that biological resources could potentially be impacted by the implementation of the Project and would like to offer recommendations on avoidance, minimization, and mitigation measures.

The Project site currently contains irrigated agriculture as well as undeveloped non-native grassland habitat that likely supports State and federally listed species. Specifically, the Department is concerned that ground-disturbing activities associated with the Project and potential infrastructure construction such as pipeline and water extraction well development could result in impacts to special-status species known to occur in the Project area including, but not limited to: nesting birds; the State and federally endangered Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*) and blunt-nosed leopard lizard (*Gambelia sila*), the latter of which is also a State fully protected species; the State threatened and federally endangered San Joaquin kit fox (*Vulpes macrotis mutica*); the State threatened San Joaquin antelope squirrel (*Ammospermophilus nelsoni*), and Swainson's hawk (*Buteo swainsoni*); the federally endangered Kern mallow (*Eremalche kernensis*), Buena Vista Lake shrew (*Sorex ornatus relictus*), and San Joaquin woollythreads (*Monolopia congdonii*); the federally threatened western snowy plover (*Charadrius alexandrinus nivosus*); the federally proposed threatened mountain plover (*Charadrius montanus*); the State Species of Special Concern tricolored blackbird (*Agelaius tricolor*), silvery legless lizard (*Anniella pulchra pulchra*), burrowing owl (*Athene cunicularia*), western pond turtle (*Emys marmorata*), loggerhead shrike (*Lanius ludovicianus*), San Joaquin whipsnake (*Masticophis flagellum ruddocki*), Tulare grasshopper mouse (*Onychomys torridus tularensis*), coast horned lizard (*Phrynosoma blainvillii*), western spadefoot (*Spea hammondii*), American badger (*Taxidea taxus*), and Le Conte's thrasher (*Toxostoma lecontei*); the California Rare Plant Rank 1B.1 listed Horn's milk-vetch (*Astragalus hornii* var. *hornii*), lesser saltscale (*Atriplex minuscula*), slough thistle (*Cirsium crassicaule*), and Coulter's goldfields (*Lasthenia glabrara* ssp. *coulteri*); the California Rare Plant Rank 1B.2 listed heartscale (*Atriplex cordulata var. cordulata*), Earlimart orache (*Atriplex cordulata var.erecticaulis*), Lost Hills crownscale (*Atriplex coronata* var. *vallicola*), Earlimart orache (*Atriplex subtilis*), and recurved larkspur (*Delphinium recurvatum*); and the California Rare Plant Rank 4.2 which was also federally delisted Hoover's eriastrum (*Eriastrum hooveri*). All these species are known to occur on or in close proximity to the subject site.

The Project site has appropriate habitat for nesting, denning, foraging, or colonization opportunities for the above species; therefore, a reconnaissance-level assessment of the Project site conducted, by a qualified wildlife biologist and a qualified botanist, is warranted. In the event that burrows, dens, and/or vegetation that could support

special-status species are present within or immediately adjacent to any portions of the Project site, the Department recommends that focused biological surveys be conducted by qualified biologists during the appropriate survey period(s) and prior to Project implementation to determine if these species are present and if they could be impacted by the proposed Project. Survey results can then be used to identify any mitigation, minimization, and avoidance measures that are to be included in the EIR prepared for this Project and any potential permitting needs. We recommend that our suggested avoidance and minimization measures be included in the EIR as enforceable mitigation measures as appropriate. Our comments follow.

Department Jurisdiction

Trustee Agency Authority: The Department is a Trustee Agency with responsibility under CEQA for commenting on projects that could impact plant and wildlife resources. Pursuant to Fish and Game Code Section 1802, the Department has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and the habitat necessary for biologically sustainable populations of those species. As a Trustee Agency for fish and wildlife resources, the Department is responsible for providing, as available, biological expertise to review and comment upon environmental documents and impacts arising from project activities, as those terms are used under CEQA (Division 13 [commencing with Section 21000] of the Public Resources Code).

Responsible Agency Authority: The Department has regulatory authority over projects that could result in the "take" of any species listed by the State as threatened or endangered, pursuant to Fish and Game Code Section 2081. If the Project could result in the "take" of any species listed as threatened or endangered under the California Endangered Species Act (CESA), the Department may need to issue an Incidental Take Permit (ITP) for the Project. CEQA requires a Mandatory Finding of Significance if a project is likely to substantially impact threatened or endangered species (sections 21001(c), 21083, Guidelines sections 15380, 15064, 15065). Impacts must be avoided or mitigated to less than significant levels unless the CEQA Lead Agency makes and supports a Statement of Overriding Consideration (SOC). The CEQA Lead Agency's SOC does not eliminate the Project proponent's obligation to comply with Fish and Game Code Section 2080. The Project has the potential to reduce the number or restrict the range of endangered, rare, or threatened species (as defined in Section 15380 of CEQA).

Unlisted Species: Species of plants and animals need not be officially listed as Endangered, Rare, or Threatened (E, R, or T) on any State or Federal list to be considered E, R, or T under CEQA. If a species can be shown to meet the criteria for E, R, or T, as specified in the CEQA Guidelines (California Code of Regulations, Title 14, Chapter 3, Section 15380), the Department recommends that it be fully considered in the environmental analysis for the Project.

Fully Protected Species: The Department has jurisdiction over fully protected species of birds, mammals, amphibians, reptiles, and fish pursuant to Fish and Game Code Sections 3511, 4700, 5050, and 5515. "Take" of any fully protected species is prohibited and the Department cannot authorize their "take".

Bird Protection: The Department has jurisdiction over actions which may result in the disturbance or destruction of active nest sites or the unauthorized "take" of birds. Fish and Game Code sections that protect birds, their eggs, and nests include sections 3503 (regarding unlawful "take," possession or needless destruction of the nest or eggs of any bird), 3503.5 (regarding the "take," possession or destruction of any birds-of-prey or their nests or eggs), and 3513 (regarding unlawful "take" of any migratory nongame bird).

Stream Alteration Agreement (SAA): The Department also has regulatory authority with regard to activities occurring in streams and/or lakes that could adversely affect any fish or wildlife resource, pursuant to Fish and Game Code sections 1600 *et seq.* Goose Lake Slough and multiple drainage channels are present within the Project site. The Department advises the Project proponent to consult with the Department before ground-breaking activities within or adjacent to any surface water features or submit a Stream Alteration Notification to determine if the surface water features and conveyance structures are within the Department's jurisdiction and an SAA is required for the proposed activities. The Department is required to comply with CEQA in the issuance or the renewal of an SAA. For additional information on notification requirements, please contact our staff in the Stream Alteration Program at (559) 243-4593.

Water Pollution: Pursuant to Fish and Game Code Section 5650, it is unlawful to deposit in, permit to pass into, or place where it can pass into "Waters of the State", any substance or material deleterious to fish, plant life, or bird life, including non-native species. The Department recommends that the EIR fully address potential pollutants to "Waters of the State" in the environmental analysis for the Project. The Regional Water Quality Control Board also has jurisdiction regarding discharge and pollution to "Waters of the State" including storm water runoff into surface waters.

Potential Project Impacts and Recommendations

Blunt-nosed Leopard Lizard (BNLL): Known occurrence records document BNLL within the boundaries of the Project site. It appears that portions of the Project site may contain undeveloped non-native grassland that could provide habitat for BNLL. Because BNLL is fully protected and, therefore, no "take" incidental or otherwise can be authorized by the Department, the Department recommends protocol-level surveys be conducted prior to any ground-disturbing activities in all areas of suitable habitat following the Department's protocol-level survey methods described in the "Approved Survey Methodology for the Blunt-nosed Leopard Lizard" (DFG, 2004). Suitable habitat

includes all areas of grassland and shrub scrub habitat that contains required habitat elements, such as small mammal burrows. The Department recommends that these surveys, the parameters of which were designed to optimize detectability, be conducted to reasonably assure the Department that "take" of this fully protected species will not occur as a result of Project implementation. In the event that this species is detected during protocol-level surveys, consultation with the Department is warranted to discuss how to implement the Project and avoid "take." It is important to note that protocol-level surveys must be conducted on multiple dates during late spring, summer, and fall and that within these time periods there are specific date, temperature, and time parameters which must be adhered to; as a result, protocol-level surveys for this species are not synonymous with 30-day "pre-construction" surveys often recommended for other wildlife species.

San Joaquin Kit Fox (SJKF): Known occurrence records document SJKF within the Project site, and therefore the Department considers the Project site as occupied habitat for the species. SJKF populations are known to den in right-of-ways, vacant lots, parks, landscaped areas, golf courses, etc., and population numbers fluctuate over years. Presence/absence in any one year does not necessarily depict the potential for kit fox to occur on a site. This is true for many other listed species in the San Joaquin Valley. It is important to note that SJKF may be attracted to the construction and disposal areas of the site due to the type and level of activity (grading, excavation, etc.) and the loose, friable soils that are created as a result of intensive ground disturbance. The Department recommends having a qualified biologist conduct focused surveys for potential, known, atypical, and active kit fox dens on the entire Project site and follow the United States Fish and Wildlife Service (USFWS) Standardized recommendations for protection of the San Joaquin kit fox prior to or during ground disturbance (2011) well in advance of ground disturbing activities. It is also recommended that a pre-construction survey be conducted and that a biological monitor be present at the excavation and spoils disposal sites. In the event that this species is detected during surveys, consultation with the Department is warranted to discuss how to implement the Project and avoid "take," or if avoidance is not feasible, to acquire a State ITP prior to any ground-disturbing.

Tipton Kangaroo Rat (TKR): Known occurrence records document TKR within the Project site. It appears that portions of the Project site may contain undeveloped parcels that could provide habitat for TKR. In order to determine if TKR occupy the Project site, focused protocol-level trapping surveys would need to be conducted by a qualified wildlife biologist that is permitted to do so by both the Department and USFWS. These surveys must be conducted well in advance of ground-disturbing activities in order to determine if impacts to TKR could occur. In order to implement full avoidance for TKR, the Department recommends a 50-foot no-disturbance buffer be employed around all burrows that could be used by TKR. If full avoidance for TKR is not feasible and "take" could occur as a result of Project implementation, acquisition of a

State ITP may be warranted prior to initiating ground-disturbing activities. Alternatively, the applicant has the option of assuming presence of these species and securing a State ITP.

San Joaquin Antelope Squirrel (SJAS): Known occurrence records document SJAS within one mile of the Project site. It appears that portions of the Project site may contain undeveloped parcels that could provide habitat for SJAS. In order to determine if SJAS occupy the Project site, focused protocol-level surveys would need to be conducted by a qualified wildlife biologist. These surveys must be conducted well in advance of ground-disturbing activities in order to determine if impacts to SJAS could occur. In order to implement full avoidance for SJAS, the Department recommends a minimum 50-foot no-disturbance buffer be employed around all burrows that could be used by SJAS. If "take" could occur as a result of Project implementation, acquisition of a State ITP would be warranted prior to initiating ground-disturbing activities. Alternatively, the applicant has the option of assuming presence of these species and securing a State ITP.

Swainson's Hawk (SWHA): Known occurrence records document SWHA within 3.5 miles of the Project site. Furthermore, Swainson's hawks are known to occur in the general vicinity of the Project. To avoid impacts to the species, the Department recommends that surveys be conducted following the survey methodology developed by the Swainson's Hawk Technical Advisory Committee (SWHA TAC, 2000), prior to any ground disturbance. These surveys, the parameters of which were designed to optimize detectability, must be conducted to reasonably assure the Department that "take" of this species will not occur as a result of disturbance associated with Project implementation. In the event that this species is detected during protocol-level surveys, consultation with the Department is warranted to discuss how to implement the Project and avoid "take," or if avoidance is not feasible, to acquire a State ITP prior to any ground-disturbing activities.

SWHA generally forage within 10 miles of their nest tree, and loss of foraging habitat could constitute a significant impact under CEQA. The Department's Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (CDFG, 1994) recommends the following:

- Projects within 1 mile of an active nest tree provide a minimum of one acre of habitat management (HM) land for each acre of development authorized.

- Projects within 5 miles of an active nest but greater than 1 mile provide a minimum of 0.75 acres of HM land for each acre of urban development authorized.

- Projects within 10 miles of an active nest tree but greater than 5 mile from an active nest tree provide a minimum of 0.5 acres of HM land for each acre of urban development authorized.

The Department recommends that funding of a sufficient long-term endowment for the management of the protected properties be paid by the Project sponsors. In addition to fee title acquisition of grassland habitat, mitigation could occur by the purchase of conservation or suitable agricultural easements. Suitable agricultural easements would include areas limited to production of crops such as alfalfa, dry land and irrigated pasture, and cereal grain crops. Vineyards, orchards, cotton fields, and other dense vegetation do not provide adequate foraging habitat. Additionally, nest trees are an extremely limited resource in the southern San Joaquin Valley; the Department recommends that lands protected as foraging habitat for SWHA exist no more than 10 miles from a SWHA nest in order to be beneficial to the species.

Special-Status Plant Species: There is the potential for multiple special-status plant species to occur on or adjacent to the Project site. The Department recommends the Project site be surveyed for special-status plants by a qualified botanist following the "Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities" (November 24, 2009). This protocol, which is intended to maximize detectability, includes the identification of reference populations to facilitate the likelihood of field investigations occurring during the appropriate floristic period. In the absence of protocol-level surveys being performed, additional surveys may be necessary. Further, the Department recommends special-status plant species be avoided whenever possible by delineation and observing a no-disturbance buffer of at least 50 feet from the outer edge of the plant population(s) or specific habitat type(s) required by special status plant species. If buffers cannot be maintained, then consultation with the Department may be warranted to determine appropriate minimization and mitigation measures for impacts to special-status plant species. If a State- or federally listed plant species is identified during botanical surveys, it is recommended consultation with the Department and/or the USFWS should be conducted to determine the need for an ITP.

Burrowing Owl: There are multiple known occurrence records of burrowing owl within one mile of the Project area. To avoid impacts to the species, we recommend that focused surveys be conducted following the survey methodology developed by the California Burrowing Owl Consortium (CBOC, 1993) well in advance of any ground disturbance associated with Project construction as well as a pre-construction survey effort. If any ground disturbing activities will occur during the burrowing owl nesting season (approximately February 1 through August 31), and potential burrowing owl burrows are present within the Project footprint, implementation of avoidance measures are warranted. In the event that burrowing owls are found, the Department's "Staff Report on Burrowing Owl Mitigation" (CDFG 2012) (Staff Report) recommends that

impacts to occupied burrows be avoided by implementation of no disturbance buffer zones (specified in the table below), unless a qualified biologist approved by the Department verifies through non-invasive methods that either: 1) the birds have not begun egg laying and incubation; or 2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival.

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

* meters (m)

Failure to implement this buffer zone could cause adult burrowing owls to abandon the nest, cause eggs or young to be directly impacted (crushed), and/or result in reproductive failure, in violation of Fish and Game Code and the Migratory Bird Treaty Act.

If the Project proposes to evict burrowing owls that may be present, the Department recommends passive relocation during the non-breeding season. We recommend that the EIR describe all avoidance measures that would be employed in the event that owls are found on the Project site, as well as methods that would be used to evict owls from burrows. We also recommend that the EIR specify how the impact of evicting owls would be mitigated to a less than significant level. The Staff Report recommends that foraging habitat be acquired and permanently protected to offset the loss of foraging and burrow habitat. The Department also recommends replacement of occupied burrows with artificial burrows at a ratio of 1 burrow collapsed to 1 artificial burrow constructed (1:1) as mitigation for the potentially significant impact of evicting a burrowing owl.

Nesting Birds: The trees, shrubs, and grasses within and in the vicinity of the Project site likely provide nesting habitat for songbirds and raptors. The Department encourages Project implementation of any new development sites to occur during the non-nesting bird season. However, if ground disturbing activities must occur during the breeding season (February through mid-September), the Project applicant is responsible for ensuring that implementation of the Project does not result in any violation of the Migratory Bird Treaty Act or relevant Fish and Game Codes as referenced above. Prior to work commencing; including staging, clearing, and grubbing, the Department recommends surveys for active nests be conducted by a qualified wildlife biologist no more than 10 days prior to the start of the of the Project commencing and that the surveys be conducted in a sufficient area around the work site to identify any nests that are present and to determine their status. A sufficient area

means any nest within an area that could potentially be affected by the Project. In addition to direct impacts, such as nest destruction, nests might be affected by noise, vibration, odors, and movement of workers or equipment. The department recommends that identified nests be continuously surveyed for the first 24 hours prior to any construction related activities to establish a behavioral baseline. Once work commences, all nests should be continuously monitored to detect any behavioral changes as a result of the Project. If behavioral changes are observed, the work causing that change should cease and the Department consulted for additional avoidance and minimization measures.

If continuous monitoring of identified nests by a qualified wildlife biologist is not feasible, the Department also recommends a minimum no disturbance buffer of 250 feet around active nests of non-listed bird species and a 500 foot no-disturbance buffer around the nests of unlisted raptors until the breeding season has ended, or until a qualified biologist has determined that the birds have fledged and are no longer reliant upon the nest or parental care for survival. Variance from these no disturbance buffers may be implemented when there is compelling biological or ecological reason to do so, such as when the Project area would be concealed from a nest site by topography. Any variance from these buffers is advised to be supported by a qualified wildlife biologist and it is recommended the Department be notified in advance of implementation of a no disturbance buffer variance.

Federally Listed Species: The Department also recommends consulting with the USFWS on potential impacts to federally listed species including, but not limited to western snowy plover, mountain plover, TKR, BNLL, SJKF, Buena Vista Lake shrew, Kern mallow, and San Joaquin woollythreads. "Take" under the Federal Endangered Species Act (FESA) is more broadly defined than CESA; "take" under FESA also includes significant habitat modification or degradation that could result in death or injury to a listed species by interfering with essential behavioral patterns such as breeding, foraging, or nesting. Consultation with the USFWS in order to comply with FESA is advised well in advance of Project implementation.

State Species of Special Concern: Tricolored blackbird, silvery legless lizard, burrowing owl, loggerhead shrike, Le Conte's thrasher, western pond turtle, coast horned lizard, San Joaquin whipsnake, Tulare grasshopper mouse, Buena Vista Lake shrew, western spadefoot, and American badger could occur in the Project area. The Department recommends that focused surveys be conducted for these species well in advance of any ground disturbance associated with Project construction. The Department recommends that the surveys be done by qualified biologists familiar with the species during the appropriate survey period(s) and prior to Project implementation to determine if these species are present and if they could be impacted by the proposed Project. Survey results can then be used to identify any mitigation, minimization, and

avoidance measures to minimize significant impacts to State Species of Special Concern.

Riparian Habitat and Wetlands: Riparian habitat and wetlands are of extreme importance to a wide variety of plant and wildlife species. Riparian habitat and wetlands are known to exist adjacent to and may be within the proposed Project site as a result of historic seeping from the earth-lined canals. The Department considers projects that impact these resources as significant if they result in a net loss of acreage or habitat value. The Department has a no-net-loss policy regarding impacts to wetlands. The Department recommends that when wetland habitat cannot be avoided, impacts to wetlands be compensated for with the creation of new habitat, preferably on-site, on a minimum of an acre-for-acre basis. Wetlands that have been inadvertently created by leaks, dams or other structures, or failures in man-made water systems are not exempt from this policy.

In addition, the Department recommends delineating all wetlands that will not be directly removed or filled with a 100-foot no-disturbance buffer and that riparian vegetation along waterways be protected with a 200-foot no-disturbance buffer from the high water mark.

More information on survey and monitoring protocols for sensitive species can be found at the Department's website (www.dfg.ca.gov/wildlife/nongame/survey_monitor.html). If you have any questions on these issues, please contact Reagen O'Leary, Environmental Scientist, at the address provided on this letterhead, by telephone at (559) 243-4014, extension 244, or by electronic mail at Reagen.OLeary@wildlife.ca.gov.

Sincerely,

Kristin Tomlinson (acting)

Jeffrey R. Single, Ph.D.
Regional Manager

cc: Thomas Leeman
United States Fish and Wildlife Service
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

Literature Cited

CBOC, 1993. Burrowing Owl Survey Protocol and Mitigation Guidelines. California Burrowing Owl Consortium, April 1993.

CDFG. 1994. Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (*Buteo swainsoni*) in the Central Valley of California. California Department of Fish and Game.

CDFG. 2004. Approved Survey Methodology for the Blunt-nosed Leopard Lizard. Department of Fish and Game, May 2004.

CDFG, 2009. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities. California Department of Fish and Game, November 2009.

CDFG, 2012. Staff Report on Burrowing Owl Mitigation. California Department of Fish and Game.

CNDDB. 2013. California Natural Diversity Database. Department of Fish and Wildlife, Sacramento, California.

SWHA TAC. 2000. Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley. Swainson's Hawk Technical Advisory Committee.

USFWS, 2011. Standard Recommendations for the Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance. United States Fish and Wildlife Service.

DuaneMorris®

COLIN L. PEARCE
DIRECT DIAL: +1 415 957 3015
PERSONAL FAX: +1 415 704 3098
E-MAIL: clpearce@duanemorris.com

www.duanemorris.com

October 23, 2013

VIA EMAIL

Eric Averett
General Manager
Rosedale-Rio Bravo Water Storage District
P.O. Box 20820
Bakersfield, CA 93390-0820

Re: City of Bakersfield's Comments to Notice of Preparation of an Environmental Impact Report for Stockdale Integrated Banking Project.

Dear Mr. Averett:

On behalf of the City of Bakersfield ("City"), we submit the following comments to the Notice of Preparation ("NOP") of an Environmental Impact Report ("EIR") for Stockdale Integrated Banking Project" ("Project") issued by the Rosedale-Rio Bravo Water Storage District ("Rosedale") on September 24, 2013.

The City generally supports the goals and purposes of the Project, as the City supports Rosedale's efforts to increase its "operational flexibility" and to otherwise efficiently and effectively manage its use of local water resources. The City still has a number of concerns with regard to the Project, the NOP, and the potential scope and contents of the EIR.

The City is particularly concerned that the Project will involve the transfer or sale of local water supplies, including the waters of the Kern River, out of Kern County to the Irvine Ranch Water District ("Irvine").

As indicated in the NOP, Irvine is a California Water District that provides a water supply to municipal and industrial customers within an 115,531 acre service area in Orange County, California. The NOP indicates that one of the primary purposes and goals of the Project is to increase Irvine's water supply. In particular, one of the "Project Objectives" is to "develop"

Irvine's "groundwater recharge, storage and recovery capacity" to provide "increased water supply reliability" for Irvine's "customers." (NOP, p. A-2.) The Project specifically would allow Irvine to maintain and utilize up to 88,000 acre feet of water in storage in Kern County "for its own use." (Id.)

The NOP further states that the Project "would enhance water supply reliability for [Irvine] by providing contingency storage to augment supplies during dry-year periods when other supply sources may be limited or unavailable." (NOP, p. A-2.) The NOP then states that the Project would "augment" Irvine's "contingency storage," allowing it to achieve its storage goals to provide the desired amount of reliability for its water supply portfolio." (Id.)

Sales and transfers of local water supplies out of the county are directly contrary to the policies and interests of the City. The City has a long standing policy, most recently confirmed in 2001, that Kern River water shall not be utilized outside the boundaries of the San Joaquin Valley Portion of Kern County.

The City is concerned that the Project would violate that policy. Development of a water supply for Irvine within Kern County would seem to necessarily and logically involve the importation or transfer of local water supplies out of the County to Orange County. The NOP, moreover, confirms that the Project could involve the storage and eventual transfer of Kern River water out of the County to Irvine.

The NOP states that water supplies used for recharge under the Project "would be secured and acquired by Rosedale and [Irvine] from various sources, including federal, state and local suppliers." (NOP, p. A-4.) The NOP further states: "Specifically water supply sources could include, but are not limited to, the State Water Project (SWP), **the Kern River**, and Central Valley Project (CVP)." (Id., emphasis added.)

The City believes it is highly questionable and suspect that Rosedale would propose to implement a project which involves the transfer of local water supplies, including Kern River supplies, to "out of county" entities, specifically to a large Southern California urban water district, at a time when the local region is suffering through a critical drought, local water supplies, including the Kern River, are drastically depleted, and groundwater levels are rapidly declining. The City is concerned that the "out-of-county" water sales or transfers proposed through the Project could cause substantial harm to the local environment, the local groundwater basin, the City's water resources and supplies, the Kern River, and the water resources of the entire southern San Joaquin Valley.

The City is additionally concerned about the Project, and the potential impacts of the Project, because the boundaries of Rosedale overlap with the boundaries of the City. Rosedale and the City spread and extract water from a shared groundwater basin. The City directly and indirectly provides water for individuals living within the overlapping City and Rosedale boundaries, and the City's Kern River water supply indirectly benefits landowners within the

remaining portion of Rosedale. Accordingly, the EIR for the Project should accurately, honestly and completely review the wide ranging potential impacts of the Project on the City, the environment in and around the City, and the City's water supply. The EIR should also completely and comprehensively review the impact of the proposed transfer of local water supplies, including Kern River water, out of the area, to Southern California.

The City has the following additional comments, questions, and concerns regarding the NOP and the Project. These comments do not constitute or represent all of the City's objections to and concerns with the Project, or to the adequacy of Rosedale's, or Irvine's, compliance with CEQA. The City reserves the right to supplement these comments, in the future, and the City reserves the right to submit substantive objections to the Project.

The "Project Description" in the NOP is deficient, as it is incomplete, vague and lacking in critical details about the Project. The Project Description fails to provide important details about the physical features of the Project and the infrastructure necessary for and related to the Project. The Project Description also lacks required information about Irvine's intended use of water stored or banked in connection with the Project.

The NOP also uses vague, general phrases to represent the objectives and goals of the Project. The NOP states, for example, that the Project will "integrate" Project facilities with existing Rosedale facilities, and will "coordinate" Project operations "to provide for maximum operational flexibility between the various programs and facilities." (NOP, p. A-2.) The NOP further states that the Project will "provide operating flexibility for Rosedale's existing and future programs." (Id.) The NOP, however, does not provide further description or definition regarding the phrases "integrate," "coordinate," and "operational flexibility." The NOP does not actually describe how the Project will achieve these goals, or how the Project will actually function in connection, or "coordination," with Rosedale's existing projects and operations. The NOP therefore does not sufficiently summarize or state the actual goals and objectives of the Project.

An NOP must contain "sufficient information describing the project and the potential environmental effects to enable the responsible agencies to make a meaningful response." (14 Cal. Code Regs. § 15082(a)(1).) Without a more specific and detailed description of the Project's objectives and goals, the City cannot make a meaningful response to the NOP.

The City questions why Rosedale, and not Irvine, is designated as the Lead Agency for the Project. The primary goal of the Project, according to the NOP, is to create or provide a water supply for Irvine and its customers. Although the Project would be located within the boundaries of Rosedale, the Project appears to only provide secondary, ancillary benefits to Rosedale. As indicated, Rosedale only refers to vague, general benefits for the Project in connection with the goals and purposes of the Project, such as increasing operational "flexibility." It does not appear, however, that Rosedale, will actually obtain or utilize a new or increased water supply in connection with the Project.

Since the Project is a water supply project for Irvine, Irvine should be lead agency for CEQA purposes. The fact that the Project is located within Rosedale does not preclude Irvine from acting as lead agency. (14 Cal. Code Regs. § 15051(a).) Irvine would appear to have "principal responsibility" for implementing the Project, since it will acquire and store water for its later use in connection with the Project. In contrast, Rosedale would appear only to have a secondary role as the operator of the Project facilities.

The description of "Water Supplies" in the NOP is deficient. The NOP indicates that water used for recharge in the Project would be secured and acquired from "various sources, including federal, state and local suppliers." (NOP, p. A-4.) The NOP later states that water sources for the Project "could" include the State Water Project, the Kern River and the Central Valley Project.

Instead of providing important and necessary information about the source of water to be used in the Project, as required under CEQA, the NOP simply claims that water could come from any potential source, under any potential scenario or circumstances. That section clearly does not present "sufficient information describing the project and the potential environmental effects to enable the responsible agencies to make a meaningful response."(14 Cal. Code Regs. § 15082(a)(1).)

It is irresponsible, and not in compliance with CEQA, for the NOP to indicate that the Project will use each and every potential available source of water, without limitation or consideration of the practical or legal consequences and impacts. The NOP should provide more specific information regarding water sources so that the EIR can properly and sufficiently analyze the impacts of the project on water supplies proposed for use in the Project.

The NOP does not indicate that the EIR will examine the impacts of the Project on other entities, such as the City, that may currently use some of the water proposed for use in the Project. The NOP further does not identify or describe the current use of the water which would be utilized in the Project, and does not describe or predict how, when and to what extent the water will be available for use in the Project.

An EIR must consider all impacts of a project on the environment, even if the impacts would be felt by another agency. (*San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus* (1994) 27 Cal.App.4th 713.) The NOP should therefore indicate that the EIR will assess the impact of the Project on the City, other water users in the region, and the Kern River.

The EIR should review the impacts of the Project on other water supply and banking projects in the area, including banking and recharge projects operated by the City, such as the Kern River channel and the 2800 Acre recharge facility. The California Supreme Court has recognized that "the future water sources for a large land use project and the impacts of exploiting those sources are not the type of information that can be deferred for future analysis."

(*Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412, 431.)

The NOP also does not provide sufficient or detailed information regarding potential "conveyance facilities" for the Project. Such facilities should be considered part of the Project, and the EIR must review and analyze impacts on the environment associated with the construction and use of such conveyance facilities.

Finally, the NOP does not reflect or mention any consideration of alternatives to the project, including the "no project" alternative. The NOP does not indicate that Rosedale and Irvine will consider conservation, additional sources of water, alternate storage locations, or other alternatives to the Project.

The statements and comments in this letter constitute only the City's comments to the NOP. The City reserves the right to comment on and raise appropriate objections and challenges to the Project, the EIR which will be prepared in connection with the Project, and any other efforts or approvals related to the Project.

We thank you for consideration of these comments. Please let us know if you have any questions in regards to these comments.

Sincerely,

Colin L. Pearce (JJE)

Colin L. Pearce
for DUANE MORRIS LLP

CLP:jlm

cc: Art Chianello, City of Bakersfield

San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

HEALTHY AIR LIVING™

October 24, 2013

Eric Averett
General Manager
Rosedale-Rio Bravo Water Storage District
P. O. Box 20820
Bakersfield, CA 93390-0820

Project: Stockdale Integrated Banking Project

District CEQA Reference No: 20130840

Dear Mr. Averett:

The San Joaquin Valley Unified Air Pollution Control District (District) has reviewed the Notice of Preparation (NOP) for the Stockdale Integrated Banking Project. The proposed project consists of the development of groundwater banking facilities on up to three properties located approximately six miles west of the city of Bakersfield. The project will allow for greater operational flexibility for the Rosedale-Rio Bravo Water Storage District and would enhance water supply reliability for the Irvine Ranch Water District. The District offers the following comments:

Emissions Analysis

1) The District is currently designated as extreme nonattainment for the 8-hour ozone standard, attainment for PM10 and CO, and nonattainment for PM2.5 for the federal air quality standards. At the state level, the District is designated as nonattainment for the 8-hour ozone, PM10, and PM2.5 air quality standards. The District recommends that the Air Quality section of the Environmental Impact Report (EIR) include a discussion of the following impacts:

   a) **Criteria Pollutants:** Project related criteria pollutant emissions should be identified and quantified. The discussion should include existing pre-project and post-project emissions.

Seyed Sadredin
Executive Director/Air Pollution Control Officer

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

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

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

www.valleyair.org www.healthyairliving.com

i) Construction Emissions: Construction emissions are short-term emissions and should be evaluated separate from operational emissions. The project would be considered to have a short-term significant impact on air quality if annual construction emissions cannot be reduced or mitigated to below the District's thresholds of significance: 10 tons per year of NOx, 10 tons per year of ROG, or 15 tons per year of PM10.

- *Recommended Mitigation:* To reduce impacts from construction related exhaust emissions, the District recommends feasible mitigation for the project to utilize off-road construction fleets that can achieve fleet average emissions equal to or cleaner than the Tier II emission standards, as set forth in §2423 of Title 13 of the California Code of Regulations, and Part 89 of Title 40 Code of Federal Regulations. This can be achieved through any combination of uncontrolled engines and engines complying with Tier II and above engine standards.

ii) Operational Emissions: Permitted (stationary sources) and non-permitted (mobile sources) sources should be analyzed separately. The project would be considered to have a long-term significant impact on air quality if annual permitted and non-permitted emissions cannot be reduced or mitigated to below the District's thresholds of significance: 10 tons per year of NOx, 10 tons per year of ROG, or 15 tons per year of PM10.

- *Recommended Mitigation:* Project related impacts on air quality can be reduced through incorporation of design elements that increase energy efficiency, reduce vehicle miles traveled, and reduce on-going operational construction exhaust emissions. However, design elements and compliance with District rules and regulations may not be sufficient to reduce project related impacts on air quality to a less than significant level. In such cases, additional mitigation would be required. An example of a feasible mitigation measure is the mitigation of project emissions through a Voluntary Emission Reduction Agreement (VERA). A VERA is an instrument by which the project proponent provides monies to the District, which is used by the District to fund emission reduction projects that achieve the reductions required by the lead agency. District staff is available to meet with project proponents to discuss a VERA for specific projects. For more information, or questions concerning this topic, please call District CEQA staff at (559) 230-5900.

iii) Recommended Model: Project related criteria pollutant emissions should be identified and quantified using CalEEMod (**Cal**ifornia **E**mission **E**stimator **Mod**el), which uses the most recent approved version of relevant Air Resources Board (ARB) emissions models and emission factors. CalEEMod is available to the public and can be downloaded from the CalEEMod website at: www.caleemod.com.

b) **Nuisance Odors:** The project should be evaluated to determine the likelihood that the project would result in nuisance odors. Nuisance orders are subjective, thus the District has not established thresholds of significance for nuisance odors. Nuisance odors may be assessed qualitatively taking into consideration of project design elements and proximity to off-site receptors that potentially would be exposed objectionable odors.

c) **Health Impacts:** Project related health impacts should be evaluated to determine if emissions of toxic air contaminants (TAC) will pose a significant health risk to nearby sensitive receptors. TACs are defined as air pollutants which may cause or contribute to an increase in mortality or serious illness, or which may pose a hazard to human health. The most common source of TACs can be attributed to diesel exhaust fumes that are emitted from both stationary and mobile sources. Health impacts may require a detailed health risk assessment (HRA).

Prior to conducting an HRA, an applicant may perform a prioritization on all sources of emissions to determine if it is necessary to conduct an HRA. A prioritization is a screening tool used to identify projects that may have significant health impacts. If the project has a prioritization score of 1.0 or more, the project has the potential to exceed the District's significance threshold for health impacts of 10 in a million and an HRA should be performed.

If an HRA is to be performed, it is recommended that the project proponent contact the District to review the proposed modeling approach. The project would be considered to have a significant health risk if the HRA demonstrates that project related health impacts would exceed the District's significance threshold of 10 in a million.

More information on TACs, prioritizations and HRAs can be obtained by:

- E-mailing inquiries to: hramodeler@valleyair.org; or
- Visiting the District's website at:

  http://www.valleyair.org/busind/pto/Tox_Resources/AirQualityMonitoring.htm.

2) In addition to the discussions on potential impacts identified above, the District recommends the EIR also include the following discussions:

a) A discussion of the methodology, model assumptions, inputs and results used in characterizing the project's impact on air quality. To comply with CEQA requirements for full disclosure, the District recommends that the modeling outputs be provided as appendices to the EIR. The District further recommends that the District be provided with an electronic copy of all input and output files for all modeling.

b) A discussion of the components and phases of the project and the associated emission projections, including ongoing emissions from each previous phase.

c) A discussion of project design elements and mitigation measures, including characterization of the effectiveness of each mitigation measure incorporated into the project.

d) A discussion of whether the project would result in a cumulatively considerable net increase of any criteria pollutant or precursor for which the San Joaquin Valley Air Basin is in non-attainment. More information on the District's attainment status can be found online by visiting the District's website at: http://valleyair.org/aqinfo/attainment.htm.

District Rules and Regulations

3) The proposed project may be subject to District rules and regulations, including: Regulation VIII (Fugitive PM10 Prohibitions), Rule 4102 (Nuisance), and Rule 4641 (Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations). In the event an existing building will be renovated, partially demolished or removed, the project may be subject to District Rule 4002 (National Emission Standards for Hazardous Air Pollutants).

4) The NOP indicates that the project includes the construction and operation of wells at the extraction facilities and a new lift head station at a conveyance facility. There is not enough information in the NOP to determine whether the new equipment associated with the project would be subject to District Rule 2010 (Permits Required) and Rule 2201 (New and Modified Stationary Source Review). As such, the applicant should contact the District's Small Business Assistance (SBA) Office to determine whether an Authority to Construct (ATC) application and Permit to Operate (PTO) will be required for this project. SBA staff can be reached by phone at (661) 392-5665.

5) Any applicant subject to District Rule 9510 (Indirect Source Review) is required to submit an Air Impact Assessment (AIA) application to the District no later than applying for final discretionary approval, and to pay any applicable off-site mitigation fees before issuance of the first building permit or emissions generating activity.

a) There is not enough information provided in the NOP for the District to make a determination of applicability of Rule 9510 to this project. The applicant should contact District ISR staff to further discuss the project and applicability to Rule 9510. District ISR staff can be reached by phone at (559) 230-5900, or by email at ISR@valleyair.org.

b) If approval of the subject project constitutes the last discretionary approval by your agency, the District recommends that demonstration of compliance with District Rule 9510, including payment of all applicable fees before issuance of the first building permit or any emissions generating activity, be made a condition of project approval. Demonstration of compliance with the rule would include a

letter from the District to the applicant indicating that either the project is not subject to the rule or that the AIA application has been approved. Information about how to comply with District Rule 9510 can be found online at: http://www.valleyair.org/ISR/ISRHome.htm.

6) The above list of rules is neither exhaustive nor exclusive. To identify other District rules or regulations that apply to this project or to obtain information about District permit requirements, SBA staff can be reached by phone at (661) 392-5665. For a complete list of all current District rules and regulations, please visit the District's website at: www.valleyair.org/rules/1ruleslist.htm.

If you have any questions or require further information, please call Jessica Willis at (559) 230-5818.

Sincerely,

David Warner
Director of Permit Services

Jessica R. Willis

For: Arnaud Marjollet
Permit Services Manager

DW:jw

cc: File

Attachment 6: Scoping Meeting Verbal Comments

Rosedale-Rio Bravo Water Storage District and Irvine Ranch Water District
Stockdale Integrated Banking Project
NOP Scoping Meeting

Public Comments

October 15, 2013: A CEQA Scoping Meeting was held at 6:30 p.m. on October 15, 2013, at Irvine Ranch Water District in Irvine, CA. There were no attendees, and no comments were recorded.

October 16, 2014: A CEQA Scoping Meeting was held at 2:00 p.m. on October 16, 2013, at Rosedale-Rio Bravo Water Storage District in Bakersfield, CA. There were two attendees, and the following comments were recorded:

- Will Stockdale East and Stockdale West be annexed into Rosedale's service area?
- Will the Stockdale EIR tier from Rosedale's Master EIR for its Conjunctive Use Program
- Have alternatives to the project been considered?
- What permits will be required to implement the project?

Attachment 7: Public Notice of Scoping Meeting

PROOF OF PUBLICATION

The BAKERSFIELD CALIFORNIAN
P. O. BOX 440
BAKERSFIELD, CA 93302

ESA / Water
626 WILSHIRE BOULEVARD SUITE 1100
LOS ANGELES, CA 90017

Ad Number:	13303039	**PO #:**	NOP
Edition:	TBC	**Run Times**	1
Class Code	Legal Notices		
Start Date	9/26/2013	**Stop Date**	9/26/2013
Billing Lines	33	**Inches**	2.76
Total Cost	$ 303.07	**Account**	73491279
Billing Address	ESA / Water 626 WILSHIRE BOULEVARDSUITE 1100 LOS ANGELES,CA 90017		

--

STATE OF CALIFORNIA
COUNTY OF KERN

I AM A CITIZEN OF THE UNITED STATES AND A RESIDENT OF THE COUNTY AFORESAID: I AM OVER THE AGE OF EIGHTEEN YEARS, AND NOT A PARTY TO OR INTERESTED IN THE ABOVE ENTITLED MATTER. I AM THE ASSISTANT PRINCIPAL CLERK OF THE PRINTER OF THE BAKERSFIELD CALIFORNIAN, A NEWSPAPER OF GENERAL CIRCULATION. PRINTED AND PUBLISHED DAILY IN THE CITY OF BAKERSFIELD COUNTY OF KERN,

AND WHICH NEWSPAPER HAS BEEN ADJUDGED A NEWSPAPER OF GENERAL CIRCULATION BY THE SUPERIOR COURT OF THE COUNTY OF KERN, STATE OF CALIFORNIA, UNDER DATE OF FEBRUARY 5, 1952, CASE NUMBER 57610; THAT THE NOTICE, OF WHICH THE ANNEXED IS A PRINTED COPY, HAS BEEN PUBLISHED IN EACH REGULAR AND ENTIRE ISSUE OF SAID NEWSPAPER
AND NOT IN ANY SUPPLEMENT THEREOF ON THE FOLLOWING DATES, TO WIT: 9/26/13

ALL IN YEAR 2013

I CERTIFY (OR DECLARE) UNDER PENALTY OF PERJURY THAT THE FOREGOING IS TRUE AND CORRECT.

Jessi Brice

DATED AT BAKERSFIELD CALIFORNIA
9/26/13

Printed on 9/26/2013 at 9:06:46AM

Solicitor I.D.: 0

First Text
Public NoticeNotice of Preparation for a

Ad Number 13303039

Public Notice
Notice of Preparation for an Environmental Impact Report

The Rosedale-Rio Bravo Water Storage District (Rosedale), as the Lead Agency, in consultation with the Irvine Ranch Water District (IRWD), as a Responsible Agency, is beginning preparation of an Environmental Impact Report (EIR) pursuant to the California Environmental Quality Act (CEQA) for the proposed Stockdale Integrated Banking Project located in Kern County.

Rosedale and IRWD have published a Notice of Preparation (NOP) of the EIR that includes a description of the proposed project and its probable environmental effects. The proposed project would develop groundwater banking facilities on up to three properties located approximately six miles west of the City of Bakersfield, including the Stockdale East property, the Stockdale West property, and a potential third property that would be located within a designated radius around both properties. Operation of the proposed project would be coordinated with Rosedale's existing Groundwater Storage, Banking, Exchange, Extraction & Conjunctive Use Program. The proposed project would provide greater operational flexibility for Rosedale and would enhance water supply reliability for IRWD by providing contingency storage to augment supplies during dry-year periods when other supply sources may be limited or not available.

The NOP will be circulated for a 30-day period beginning on September 24, 2013 and ending on October 24, 2013. Rosedale and IRWD are soliciting the views of responsible and trustee agencies and interested persons as to the scope and content of the environmental information to be evaluated in the EIR. Please send your comments to Rosedale-Rio Bravo Water Storage District, Eric Averett, General Manager, P.O. Box 20820,Bakersfield, CA 93390-0820 or eaverett@rrbwsd.com

Two public meetings will be held to receive public comments and suggestions: Tuesday, October 15, 2013, at 6:30PM at IRWD, 15600 Sand Canyon Avenue, Irvine CA, and Wednesday, October 16, 2013, at 2:00 PM at Rosedale, 849 Allen Road, Bakersfield, CA.

September 26, 2013 (13303039)

AFFIDAVIT OF PUBLICATION

STATE OF CALIFORNIA,)
) ss.
County of Orange)

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of **The Orange County Register**, a newspaper of general circulation, published in the city of Santa Ana, County of Orange, and which newspaper has been adjudged to be a newspaper of general circulation by the Superior Court of the County of Orange, State of California, under the date of November 19, 1905, Case No. A-21046, that the notice, of which the annexed is a true printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

September 26, 2013

"I certify (or declare) under the penalty of perjury under the laws of the State of California that the foregoing is true and correct":

Executed at Santa Ana, Orange County, California, on

Date: September 26, 2013

Angel Bates

Signature

The Orange County Register
625 N. Grand Ave.
Santa Ana, CA 92701
(714) 796-2209

PROOF OF PUBLICATION

Public Notice
Notice of Preparation for an Environmental Impact Report

The Rosedale-Rio Bravo Water Storage District (Rosedale), as the Lead Agency, in consultation with the Irvine Ranch Water District (IRWD), as a Responsible Agency, is beginning preparation of an Environmental Impact Report (EIR) pursuant to the California Environmental Quality Act (CEQA) for the proposed Stockdale Integrated Banking Project located in Kern County.

Rosedale and IRWD have published a Notice of Preparation (NOP) of the EIR that includes a description of the proposed project and its probable environmental effects. The proposed project would develop groundwater banking facilities on up to three properties located approximately six miles west of the City of Bakersfield, including the Stockdale East property, the Stockdale West property, and a potential third property that would be located within a designated radius around both properties. Operation of the proposed project would be coordinated with Rosedale's existing Groundwater Storage, Banking, Exchange, Extraction & Conjunctive Use Program. The proposed project would provide greater operational flexibility for Rosedale and would enhance water supply reliability for IRWD by providing contingency storage to augment supplies during dry-year periods when other supply sources may be limited or not available.

The NOP will be circulated for a 30-day period beginning on September 24, 2013 and ending on October 24, 2013. Rosedale and IRWD are soliciting the views of responsible and trustee agencies and interested persons as to the scope and content of the environmental information to be evaluated in the EIR. Please send your comments to Rosedale-Rio Bravo Water Storage District, Eric Averett, General Manager, P.O. Box 20820,Bakersfield, CA 93390-0820 or eaverett@rrbwsd.com

Two public meetings will be held to receive public comments and suggestions: Tuesday, October 15, 2013, at 6:30PM at IRWD, 15600 Sand Canyon Avenue, Irvine CA, and Wednesday, October 16, 2013, at 2:00 PM at Rosedale, 849 Allen Road, Bakersfield, CA.

Published: Orange County Register September 26, 2013. R-1514 9733183

Appendix B-1

Memorandum of Understanding
Groundwater Banking Program

FIRST AMENDED
MEMORANDUM OF UNDERSTANDING
REGARDING OPERATION AND MONITORING
OF THE
ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT
GROUNDWATER BANKING PROGRAM

This Memorandum of Understanding is entered into the Effective Date hereof by and among **ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT**, hereinafter referred to as "Rosedale", and **SEMITROPIC WATER STORAGE DISTRICT, BUENA VISTA WATER STORAGE DISTRICT, HENRY MILLER WATER DISTRICT, KERN COUNTY WATER AGENCY, KERN WATER BANK AUTHORITY, IMPROVEMENT DISTRICT NO. 4 OF THE KERN COUNTY WATER AGENCY**, and **WEST KERN WATER DISTRICT**, collectively referred to as "Adjoining Entities."

R E C I T A L S

WHEREAS, Rosedale expects that certain real property more particularly shown on the map attached hereto as Exhibit A and incorporated herein by this reference ("Project Site"), or portions thereof, will be used in connection with the Project; and

WHEREAS, Rosedale intends to develop and improve the Project Site as necessary to permit the importation, percolation and storage of water in underground aquifers for later recovery, transportation and use for the benefit of Rosedale, all as more fully described in Exhibit B attached hereto and incorporated herein by this reference ("Project"); and

WHEREAS, Adjoining Entities encompass lands and/or operate existing projects lying adjacent to the Project Site as shown on said Exhibit A; and

WHEREAS, in recent years, water banking, recovery and transfer programs in Kern County have become increasingly numerous and complex; and

WHEREAS, it is appropriate and desirable to mitigate or eliminate any short-term and long-term significant adverse impacts of new programs upon potentially affected projects and landowners within the boundaries of Adjoining Entities; and

WHEREAS, Adjoining Entities and Rosedale desire that the design, operation and monitoring of the Project be conducted and coordinated in a manner to insure that the beneficial effects of the Project to Rosedale are maximized but that the Project does not result in significant adverse impacts to water levels, water quality or land subsidence within the boundaries of Adjoining Entities, or otherwise interfere with the existing and ongoing programs of Adjoining Entities; and

WHEREAS, on October 26, 1995, the Kern Water Bank Authority and its Member Entities, as the "Project Participants," and Buena Vista Water Storage District, Rosedale-Rio Bravo Water Storage District, Kern Delta Water District, Henry Miller Water District and West Kern Water District, as the "Adjoining Entities," entered into a Memorandum of Understanding, similar to this Memorandum of Understanding, which provided among other things at Paragraph 8 that for "any future project within the Kern Fan Area, the Parties hereto shall use good faith efforts to negotiate an agreement substantially similar in substance to this MOU," and by entering into this MOU the Adjoining Entities find that this MOU satisfies such requirement for the Project; and

WHEREAS, Rosedale intends to operate its Project such that the same does not cause or contribute to overdraft of the groundwater basin; and

WHEREAS, in connection with its environmental review for the Project, Rosedale commissioned a hydrologic balance study for a period of years, which study shows that the District is not currently operating in a state of overdraft, and, further, Rosedale has projected said hydrologic balance study into the future, assuming completion of the Project, and said projection demonstrates that the District is not expected to operate in state of overdraft following implementation of the Project, which studies have not been independently verified by the Adjoining Entities; and

WHEREAS, in the hydrologic balance studies conducted by Rosedale in connection with the Project, the annual safe yield from the groundwater basin is assumed to be .3 acre-feet per acre times the gross developed acres in the District and no assumption is included with respect to groundwater inflow or outflow; and

WHEREAS, this MOU affects the Project and other similar banking programs operated for the benefit of third parties. Conversely, this MOU does not apply to or permit any project involving the sale by Rosedale of water banked in the name of, and within the boundaries of, Rosedale to third parties for a use outside the boundaries of Rosedale.

NOW, THEREFORE, BE IT RESOLVED that, based upon the mutual covenants contained herein, the parties hereto agree as follows:

1. Project Design and Construction. Rosedale has completed a preliminary Project Description of the Project described in Exhibit B hereto representing the contemplated facilities for the Project. Said preliminary description has been reviewed by the parties hereto. The foregoing shall not be interpreted to imply consent to any aspect of any future project not described in existing approved environmental documentation. Rosedale will construct the Project consistent with such preliminary description. Any major modifications of the facilities and/or significant changes from that described in Exhibit B and in the environmental documentation for the Project will be subject to additional environmental review pursuant to CEQA and will be subject to review of the Monitoring Committee prior to implementation.

2. Project Operation. The Project shall be operated to achieve the maximum water storage and withdrawal benefits for Rosedale consistent with avoiding, mitigating or eliminating to the greatest extent practicable, significant adverse impacts resulting from the Project. To that end, the Project shall be operated in accordance with the following Project Objectives and Minimum Operating Criteria:

a. Project Objectives. Consistent with the Project description, Rosedale will make a good faith effort to meet the following objectives, which may or may not be met:

(1) The parties should operate their projects in such manner as to maintain and, when possible, enhance the quality of groundwater within the Project Site and the Kern Fan Area as shown in Exhibit C.

(2) If supplies of acceptable recharge water exceed recharge capacity, all other things being equal, recharge priority should be given to the purest or best quality water.

(3) Each project within the Kern Fan Area should be operated with the objective that the average concentration of total dissolved salts in the recovered water will exceed the average concentration of total dissolved salts in the recharged water, at a minimum, by a percentage equal to or greater than the percentage of surface recharge losses. The average shall be calculated from the start of each project.

(4) To maintain or improve groundwater quality, recovery operations should extract poorer quality groundwater where practicable. Blending may be used to increase recovery of lesser quality groundwater unless doing so will exacerbate problems by generating unfavorable movement of lesser quality groundwater. It is recognized that the extent to which blending can help to resolve groundwater quality problems is limited by regulatory agency rules regarding discharges into conveyance systems used for municipal supplies, which may be changed from time to time.

(5) All groundwater pumpers should attempt to control the migration of poor quality water. Extensive monitoring will be used to identify the migration of poor quality water and give advance notice of developing problems. Problem areas may be dealt with by actions including, but not limited to:

(a) limiting or terminating extractions that tend to draw lesser quality water toward or into the usable water areas;

(b) increasing extractions in areas that might generate a beneficial, reverse gradient;

(c) increasing recharge within the usable water area to promote favorable groundwater gradients.

(6) It is intended that all recovery of recharged water be subject to the so-called "golden rule." In the context of a banking project, the "golden rule" means that, unless acceptable mitigation is provided, the banker may not operate so as to create conditions that are worse than would have prevailed absent the project giving due recognition to the benefits that may result from the project, all as more fully described at paragraph 2(b)12 below.

(7) The Project shall be developed and operated so as to prevent, eliminate or mitigate significant adverse impacts. Thus, the Project shall incorporate mitigation measures as necessary. Mitigation measures to prevent significant adverse impacts from occurring include but are not limited to the following: (i) spread out recovery area; (ii) provide buffer areas between recovery wells and neighboring overlying users; (iii) limit the monthly, seasonal, and/or annual recovery rate; (iv) provide sufficient recovery wells to allow rotation of recovery wells or the use of alternate wells; (v) provide adequate well spacing; (vi) adjust pumping rates or terminate pumping to reduce impacts, if necessary; (vii) impose time restrictions between recharge and recovery to allow for downward percolation of water to the aquifer; and (viii) provide recharge of water that would otherwise not recharge the Kern Fan Basin. Mitigation measures that compensate for unavoidable adverse impacts include but are not limited to the following: (i) with the consent of the affected groundwater pumper, lower the pump bowls or deepen wells as necessary to restore groundwater extraction capability to such pumper; (ii) with the consent of the affected groundwater pumper, provide alternative water supplies to such pumper; and (iii) with the consent of the affected groundwater pumper, provide financial compensation to such pumper.

b. Minimum Operating Criteria.

(1) The Monitoring Committee shall be notified prior to the recharge of potentially unacceptable water, such as "produced water" from oilfield operations, reclaimed water, or the like. The Monitoring Committee shall review the proposed recharge and make recommendations respecting the same as it deems appropriate. Where approval by the Regional Water Quality Control Board is required, the issuance of such approval by said Board shall satisfy this requirement.

(2) Recharge may not occur in, on or near contaminated areas, nor may anyone spread in, on or near an adjoining area if the effect will be to mound water near enough to the contaminated area that the contaminants will be picked up and carried into the uncontaminated groundwater supply. When contaminated areas are identified within or adjacent to the Project, Rosedale shall also:

(a) participate with other groundwater pumpers to investigate the source of the contamination;

(b) work with appropriate authorities to ensure that the entity or individual, if any, responsible for the contamination meets its responsibilities to remove the contamination and thereby return the Project Site to its full recharge and storage capacity;

(c) operate the Project in cooperation with other groundwater pumpers to attempt to eliminate the migration of contaminated water toward or into usable water quality areas.

(3) Operators of projects within the Kern Fan Area will avoid operating such projects in a fashion so as to significantly diminish the natural, normal and unavoidable recharge of water

native to the Kern Fan Area as it existed in pre-project condition. If and to the extent this occurs as determined by the Monitoring Committee, the parties will cooperate to provide equivalent recharge capacity to offset such impact.

(4) The mitigation credit for fallowed Project land shall be .3 acre-feet per acre per year times the amount of fallowed land included in the Project Site in the year of calculation.

(5) The lands shown in Exhibit A may be utilized for any purpose provided, however, the use of said property by Rosedale for the Project shall not cause or contribute to overdraft of the groundwater basin.

(6) Each device proposed to measure recharge water to be subsequently recovered and/or recovery of such water will be initially evaluated and periodically reviewed by the Monitoring Committee. Each measuring device shall be properly installed, calibrated, rated, monitored and maintained by and at the expense of the owner of the measuring device.

(7) It shall be the responsibility of the user to insure that all measuring devices are accurate and that the measurements are provided to the Monitoring Committee at the time and in the manner required by the Monitoring Committee.

(8) A producer's flow deposited into another facility, such as a transportation canal, shall be measured into such facility by the operator thereof and the measurement reported to the Monitoring Committee at the time and in the manner required by such Monitoring Committee.

(9) The Monitoring Committee or its designee will maintain official records of recharge and recovery activities, which records shall be open and available to the public. The Monitoring Committee will have the right to verify the accuracy of reported information by

inspection, observation or access to user records (i.e., P.G.&E. bills). The Monitoring Committee will publish or cause to be published annual reports of operations.

(10) Losses shall be assessed as follows:

(a) Surface recharge losses shall be fixed and assessed at a rate of 3%, which includes a "safety factor" of 1% of water diverted for direct recharge. An additional surface recharge loss of 3% shall be fixed and assessed against water directly recharged which is subsequently extracted for out-of-district use. Such initial 3% loss may be modified in the future if studies acceptable to the parties demonstrate that such modification is appropriate, providing that a 1% "safety factor" shall be maintained and the total loss when directly recharged water is subsequently extracted for out-of-district use shall not exceed 6%. Notwithstanding anything to the contrary provided herein, water banked in Rosedale for or on behalf of third parties (i.e., creating a third party bank account) shall be subject to surface recharge losses calculated at 6% of water diverted for direct recharge.

(b) To account for all other actual or potential losses (including migration losses), a rate of 4% of water placed in a bank account shall be deducted to the extent that Rosedale has been compensated within three (3) years following the end of the calendar year in which the water was designated as banked at the SWP Delta Water Rate charged by DWR at the time of payment; provided further, however, that the water purchased and subtracted from a groundwater bank account pursuant to this provision shall only be used for overdraft correction within the District purchasing the water.

(c) An additional 5% loss shall be assessed against any water diverted to the Project Site for banking by, for, or on behalf of any out-of-County person, entity or organization (except current SWP Agricultural Contractors).

(d) All losses provided for herein represent amounts of water that are non-bankable and non-recoverable by Rosedale.

(11) Recovery of banked water shall be from the Project Site and recovery facilities shall be located therein. Recovery from outside the Project Site may be allowed with the consent of the District or entity having jurisdiction over the area from which the recovery will occur and upon review by the Monitoring Committee.

(12) Recovery of banked water may not be allowed if not otherwise mitigated if it will result in significant adverse impacts to surrounding overlying users. "Adverse impacts" will be evaluated using data applicable in zones including the area which may be affected by the Project of approximately five miles in width from the boundaries of the Project as designated by the Monitoring Committee. In determining "adverse impacts," as provided at this paragraph and elsewhere in this MOU, consideration will be given to the benefits accrued over time during operation of the Project to landowners surrounding the Project Site including higher groundwater levels as a result of operation of the Project. In determining non-Project conditions vs. Project conditions, credit toward mitigation of any otherwise adverse impacts shall be recognized to the extent of the 4% loss and 5% losses recognized under paragraphs 2.b.(10)(b) and (c), for the mitigation credit recognized under paragraph 2.b.(4), if any, and to the extent of recharge on the Project Site for overdraft correction.

(13) To the extent that interference, other than insignificant interference, with the pumping lift of any existing active well as compared to non-Project conditions, is attributable to pumping of any wells on the Project Site, Rosedale will either stop pumping as necessary to mitigate the interference or compensate the owner for such interference, or any combination thereof. The Monitoring Committee will establish the criteria necessary to determine if well interference, other than insignificant interference, is attributable to pumping of Project wells by conducting pumping tests of Project wells following the installation of monitoring wells (if not already completed) and considering hydrogeologic information.

(14) The Kern Fan Element Groundwater Model, with input from Rosedale and the Adjoining Entities, and utilizing data from a comprehensive groundwater monitoring program, may be used by the Monitoring Committee as appropriate to estimate groundwater impacts of the Project.

(15) The parties recognize that the Project shall be operated with a positive balance, i.e., there shall be no "borrowing" of water for recovery from the basin.

3. Project Monitoring. Adjoining Entities agree to participate in a comprehensive monitoring program and as members of a Monitoring Committee, as hereinafter more particularly described, in order to reasonably determine groundwater level and water quality information under Project and non-Project conditions. The monitoring program will more particularly require the following:

a. Monitoring Committee: Rosedale and the Adjoining Entities shall form a Monitoring Committee for the Project upon terms and conditions acceptable to the participants. The Monitoring Committee shall:

(1) Engage the services of a suitable independent professional groundwater specialist who shall, at the direction of the Committee, provide assistance in the performance of the tasks identified below;

(2) Meet and confer monthly or at other intervals deemed to be appropriate in furtherance of the monitoring program;

(3) Establish a groundwater evaluation methodology or methodologies;

(4) Prepare a monitoring plan and two associated maps, "Well Location, Water Quality Network," and "Well Location, Water Level Network," which plan and maps depict the location and types of wells anticipated to be used in the initial phase of groundwater monitoring (said plan and maps are expected to be modified from time to time as the monitoring program is developed and operated);

(5) Specify such additional monitoring wells and ancillary equipment as are deemed to be necessary or desirable for the purposes hereof;

(6) Prepare annual water balance studies and other interpretive studies, which will designate all sources of water and the use thereof within the study area;

(7) Develop criteria for determining whether excessive mounding or withdrawal is occurring or is likely to occur in an area of interest;

(8) Annually or as otherwise needed determine the impacts of the Project on each of the Adjoining Entities by evaluating with and without Project conditions; and

(9) Develop procedures, review data, and recommend Project operational criteria for the purpose of identifying, verifying, avoiding, eliminating or mitigating, to the extent practicable, the creation of significant imbalances or significant adverse impacts.

b. Collection and Sharing of Data. The Adjoining Entities will make available to the Monitoring Committee copies of all relevant groundwater level, groundwater quality, and other monitoring data currently collected and prepared by each. Rosedale shall annually report, by areas of interest, water deliveries for banking and other purposes, groundwater withdrawals from bank accounts, transfers and other changes in account balances.

c. Monitoring Costs.

(1) The cost of constructing monitoring wells and ancillary equipment within Rosedale shall be borne by Rosedale. The cost of any new or additional monitoring wells and ancillary equipment outside the boundaries of Rosedale shall be borne as may be determined by separate agreement of Rosedale and the Adjoining Entities.

(2) Each of the parties shall be responsible for the personnel costs of its representative on the Monitoring Committee. In addition, the Adjoining Entities shall be responsible for all costs of monitoring operations and facilities within their respective boundaries and Rosedale shall be responsible for all costs of monitoring operations and facilities within the Project Site.

(3) All other groundwater monitoring costs, including employment of the professional groundwater specialist, collection, evaluation and analyses of data as adopted by the Monitoring Committee, shall be allocated among and borne by the parties as they shall agree among themselves. Cost sharing among Adjoining Entities shall be as agreed by them. Any additional monitoring costs shall be determined and allocated by separate agreement of those parties requesting such additional monitoring.

4. Modification of Project Operations. The Monitoring Committee may make recommendations to Rosedale, including without limitation recommendations for modifications in Project operations based upon evaluation(s) of data which indicate that excessive mounding or withdrawal is occurring or is likely to occur in an area of interest. The Monitoring Committee and its members shall not act in an arbitrary, capricious or unreasonable manner.

5. Dispute Resolution.

a. Submission to Monitoring Committee. All disputes regarding the operation of the Project or the application of this MOU, or any provision hereof, shall first be submitted to the Monitoring Committee for review and analysis. The Monitoring Committee shall meet and review all relevant data and facts regarding the dispute and, if possible, recommend a fair and equitable resolution of the dispute. The Monitoring Committee and its members shall not act in an arbitrary, capricious or unreasonable manner. In the event that (1) the Monitoring Committee fails to act as herein provided, (2) any party disputes the Monitoring Committee's recommended resolution or (3) any party fails to implement the Monitoring Committee's recommended resolution within the time allowed, any party to this MOU may seek any legal or equitable remedy available as hereinafter provided.

b. Arbitration. If all of the parties agree that a factual dispute exists regarding any recommendation of the Monitoring Committee made pursuant hereto, or implementation thereof, such dispute shall, be submitted to binding arbitration before a single neutral arbitrator appointed by unanimous consent and, in the absence of such consent, appointed by the presiding judge of the Kern County Superior Court. The neutral arbitrator shall be a registered civil engineer, registered geologist, or other person agreeable to the parties, preferably with a background in groundwater hydrology. The arbitration shall be called and conducted in accordance with such rules as the contestants shall agree upon, and, in the absence of such agreement, in accordance with the procedures set forth in California Code of Civil Procedure section 1282, et seq. Any other dispute may be pursued through a court of competent jurisdiction as otherwise provided by law.

c. Burden of Proof. In the event of arbitration or litigation under this MOU, all parties shall enjoy the benefit of such presumptions as are provided by law but, in the absence thereof, neither party shall bear the burden of proof on any contested legal or factual issue.

d. Landowner Remedies. Nothing in this MOU shall prevent any landowner within the boundaries of any party from pursuing any remedy at law or in equity in the event such landowner is damaged as a result of projects within the Kern Fan Area.

6. Term. The Effective Date of this MOU shall be January 1, 2003 regardless of the date of actual execution. This MOU shall continue in force and effect from and after the Effective Date until terminated by (1) operation of law, (2) unanimous consent of the parties, or (3) abandonment of the Project and a determination by the Monitoring Committee that all adverse impacts have been fully eliminated or mitigated as provided in this MOU.

7. Complete Agreement/Incorporation Into Banking Agreements. This MOU constitutes the whole and complete agreement of the parties regarding Project operation, maintenance and monitoring (amending and replacing the original MOU between the parties regarding Rosedale's Groundwater Banking Program). Rosedale shall incorporate this MOU by reference into any further agreement it enters into respecting banking of water in or withdrawal of water from the Project Site.

8. Future Projects. With respect to any future project within the Kern Fan Area, the Parties hereto shall use good faith efforts to negotiate an agreement substantially similar in substance to this MOU.

9. Notice Clause. All notices required by this MOU shall be sent via first class United States mail to the addresses shown on the signature page of this agreement and shall be deemed delivered three days after deposited in the mail. Notice of changes in the representative or address of a party shall be given in the same manner.

10. California Law Clause. All provisions of this MOU and all rights and obligations of the parties hereto shall be interpreted and construed according to the laws of the State of California.

11. Amendments. This MOU may be amended by written instrument executed by all of the parties. In addition, recognizing that the parties may not now be able to contemplate all the implications of the Project, the parties agree that on the tenth anniversary of implementation of the Project, if facts and conditions not envisioned at the time of entering into this MOU are present, the parties will negotiate in good faith amendments to this MOU. If the parties cannot

agree on whether conditions have changed necessitating an amendment and/or upon appropriate amendments to the MOU, such limited issues shall be submitted to an arbitrator or court, as the case may be, as provided above.

12. Successors and Assigns. This MOU shall bind and inure to the benefit of the successors and assigns of the parties.

13. Severability. The rights and privileges set forth in this MOU are severable and the failure or invalidity of any particular provision of this MOU shall not invalidate the other provisions of this MOU; rather all other provisions of this MOU shall continue and remain in full force and effect notwithstanding such partial failure or invalidity.

14. Force Majeure. All obligations of the parties shall be suspended for so long as and to the extent the performance thereof is prevented, directly or indirectly, by earthquakes, fires, tornadoes, facility failures, floods, drownings, strikes, other casualties, acts of God, orders of court or governmental agencies having competent jurisdiction, or other events or causes beyond the control of the parties. In no event shall any liability accrue against a party, or its officers, agents or employees, for any damage arising out of or connected with a suspension of performance pursuant to this paragraph.

15. Counterparts. This MOU, and any amendment or supplement thereto, may be executed in two or more counterparts, and by each party on a separate counterpart, each of which, when executed and delivered, shall be an original and all of which together shall constitute one instrument, with the same force and effect as though all signatures appeared on a single document. In proving this MOU or any such amendment, supplement, document or

instrument, it shall not be necessary to produce or account for more than one counterpart thereof signed by the party against whom enforcement is sought.

IN WITNESS WHEREOF the parties have executed this MOU the day and year first above written at Bakersfield, California.

ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT
P. O. Box 867
Bakersfield, CA 93302-0867

By:_____

By:_____

WEST KERN WATER DISTRICT
800 Kern Street
P. O. Box 1105
Taft, CA 93268-1105

By:_____

By:_____

SEMITROPIC WATER STORAGE DISTRICT
P. O. Box Z
Wasco, CA 93280-0877

By:_____

By:_____

BUENA VISTA WATER STORAGE DISTRICT
P. O. Box 756
Buttonwillow, CA 93206

By:_____

By:_____

HENRY MILLER WATER DISTRICT
P. O. Box 9759
Bakersfield, CA 93389-9759

By:_____

By:_____

KERN WATER BANK AUTHORITY
P. O. Box 80607
Bakersfield, CA 93380-0607

By:_____

By:_____

KERN COUNTY WATER AGENCY
P. O. Box 58
Bakersfield, CA 93302-0058

By:_____

By:_____

IMPROVEMENT DISTRICT NO. 4
P. O. Box 58
Bakersfield, CA 93302-0058

By:_____

By:_____

instrument, it shall not be necessary to produce or account for more than one counterpart thereof signed by the party against whom enforcement is sought.

IN WITNESS WHEREOF the parties have executed this MOU the day and year first above written at Bakersfield, California.

ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT
P. O. Box 867
Bakersfield, CA 93302-0867

By:_____

By:_____

WEST KERN WATER DISTRICT
800 Kern Street
P. O. Box 1105
Taft, CA 93268-1105

By:_____

By:_____

SEMITROPIC WATER STORAGE DISTRICT
P. O. Box Z
Wasco, CA 93280-0877

By:_____

By:_____

BUENA VISTA WATER STORAGE DISTRICT
P. O. Box 756
Buttonwillow, CA 93206

By:_____

By:_____

HENRY MILLER WATER DISTRICT
P. O. Box 9759
Bakersfield, CA 93389-9759

By:_____

By:_____

KERN WATER BANK AUTHORITY
P. O. Box 80607
Bakersfield, CA 93380-0607

By:_____

By:_____

KERN COUNTY WATER AGENCY
P. O. Box 58
Bakersfield, CA 93302-0058

By:_____

By:_____

IMPROVEMENT DISTRICT NO. 4
P. O. Box 58
Bakersfield, CA 93302-0058

By:_____

By:_____

instrument, it shall not be necessary to produce or account for more than one counterpart thereof signed by the party against whom enforcement is sought.

IN WITNESS WHEREOF the parties have executed this MOU the day and year first above written at Bakersfield, California.

ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT
P. O. Box 867
Bakersfield, CA 93302-0867

By:_____

By:_____

WEST KERN WATER DISTRICT
800 Kern Street
P. O. Box 1105
Taft, CA 93268-1105

By:_____

By:_____

SEMITROPIC WATER STORAGE DISTRICT
P. O. Box Z
Wasco, CA 93280-0877

By:_____

By:_____

BUENA VISTA WATER STORAGE DISTRICT
P. O. Box 756
Buttonwillow, CA 93206

By:_____

By:_____

HENRY MILLER WATER DISTRICT
P. O. Box 9759
Bakersfield, CA 93389-9759

By:_____

By:_____

KERN WATER BANK AUTHORITY
P. O. Box 80607
Bakersfield, CA 93380-0607

By:_____

By:_____

KERN COUNTY WATER AGENCY
P. O. Box 58
Bakersfield, CA 93302-0058

By:_____

By:_____

IMPROVEMENT DISTRICT NO. 4
P. O. Box 58
Bakersfield, CA 93302-0058

By:_____

By:_____

instrument, it shall not be necessary to produce or account for more than one counterpart thereof signed by the party against whom enforcement is sought.

IN WITNESS WHEREOF the parties have executed this MOU the day and year first above written at Bakersfield, California.

ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT
P. O. Box 867
Bakersfield, CA 93302-0867

By:_____

By:_____

WEST KERN WATER DISTRICT
800 Kern Street
P. O. Box 1105
Taft, CA 93268-1105

By:_____

By:_____

SEMITROPIC WATER STORAGE DISTRICT
P. O. Box Z
Wasco, CA 93280-0877

By:_____

By:_____

BUENA VISTA WATER STORAGE DISTRICT
P. O. Box 756
Buttonwillow, CA 93206

By:_____

By:_____

HENRY MILLER WATER DISTRICT
P. O. Box 9759
Bakersfield, CA 93389-9759

By:_____

By:_____

KERN WATER BANK AUTHORITY
P. O. Box 80607
Bakersfield, CA 93380-0607

By:_____

By:_____

KERN COUNTY WATER AGENCY
P. O. Box 58
Bakersfield, CA 93302-0058

By:_____

By:_____

IMPROVEMENT DISTRICT NO. 4
P. O. Box 58
Bakersfield, CA 93302-0058

By:_____

By:_____

instrument, it shall not be necessary to produce or account for more than one counterpart thereof signed by the party against whom enforcement is sought.

IN WITNESS WHEREOF the parties have executed this MOU the day and year first above written at Bakersfield, California.

ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT
P. O. Box 867
Bakersfield, CA 93302-0867

By:_____

By:_____

WEST KERN WATER DISTRICT
800 Kern Street
P. O. Box 1105
Taft, CA 93268-1105

By:_____

By:_____

SEMITROPIC WATER STORAGE DISTRICT
P. O. Box Z
Wasco, CA 93280-0877

By:_____

By:_____

BUENA VISTA WATER STORAGE DISTRICT
P. O. Box 756
Buttonwillow, CA 93206

By:_____

By:_____

HENRY MILLER WATER DISTRICT
P. O. Box 9759
Bakersfield, CA 93389-9759

By:_____

By:_____

KERN WATER BANK AUTHORITY
P. O. Box 80607
Bakersfield, CA 93380-0607

By:_____

By:_____

KERN COUNTY WATER AGENCY
P. O. Box 58
Bakersfield, CA 93302-0058

By:_____

By:_____

IMPROVEMENT DISTRICT NO. 4
P. O. Box 58
Bakersfield, CA 93302-0058

By:_____

By:_____

instrument, it shall not be necessary to produce or account for more than one counterpart thereof signed by the party against whom enforcement is sought.

IN WITNESS WHEREOF the parties have executed this MOU the day and year first above written at Bakersfield, California.

ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT
P. O. Box 867
Bakersfield, CA 93302-0867

By:_____

By:_____

WEST KERN WATER DISTRICT
800 Kern Street
P. O. Box 1105
Taft, CA 93268-1105

By:_____

By:_____

SEMITROPIC WATER STORAGE DISTRICT
P. O. Box Z
Wasco, CA 93280-0877

By:_____

By:_____

BUENA VISTA WATER STORAGE DISTRICT
P. O. Box 756
Buttonwillow, CA 93206

By:_____

By:_____

HENRY MILLER WATER DISTRICT
P. O. Box 9759
Bakersfield, CA 93389-9759

By:_____

By:_____

KERN WATER BANK AUTHORITY
P. O. Box 80607
Bakersfield, CA 93380-0607

By:_____

By:_____

KERN COUNTY WATER AGENCY
P. O. Box 58
Bakersfield, CA 93302-0058

By:_____

By:_____

IMPROVEMENT DISTRICT NO. 4
P. O. Box 58
Bakersfield, CA 93302-0058

By:_____

By:_____

instrument, it shall not be necessary to produce or account for more than one counterpart thereof signed by the party against whom enforcement is sought.

IN WITNESS WHEREOF the parties have executed this MOU the day and year first above written at Bakersfield, California.

ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT
P. O. Box 867
Bakersfield, CA 93302-0867

By:_____

By:_____

WEST KERN WATER DISTRICT
800 Kern Street
P. O. Box 1105
Taft, CA 93268-1105

By:_____

By:_____

SEMITROPIC WATER STORAGE DISTRICT
P. O. Box Z
Wasco, CA 93280-0877

By:_____

By:_____

BUENA VISTA WATER STORAGE DISTRICT
P. O. Box 756
Buttonwillow, CA 93206

By:_____

By:_____

HENRY MILLER WATER DISTRICT
P. O. Box 9759
Bakersfield, CA 93389-9759

By:_____

By:_____

KERN WATER BANK AUTHORITY
P. O. Box 80607
Bakersfield, CA 93380-0607

By:_____

By:_____

KERN COUNTY WATER AGENCY
P. O. Box 58
Bakersfield, CA 93302-0058

By:_____

By:_____

IMPROVEMENT DISTRICT NO. 4
P. O. Box 58
Bakersfield, CA 93302-0058

By:_____

By:_____

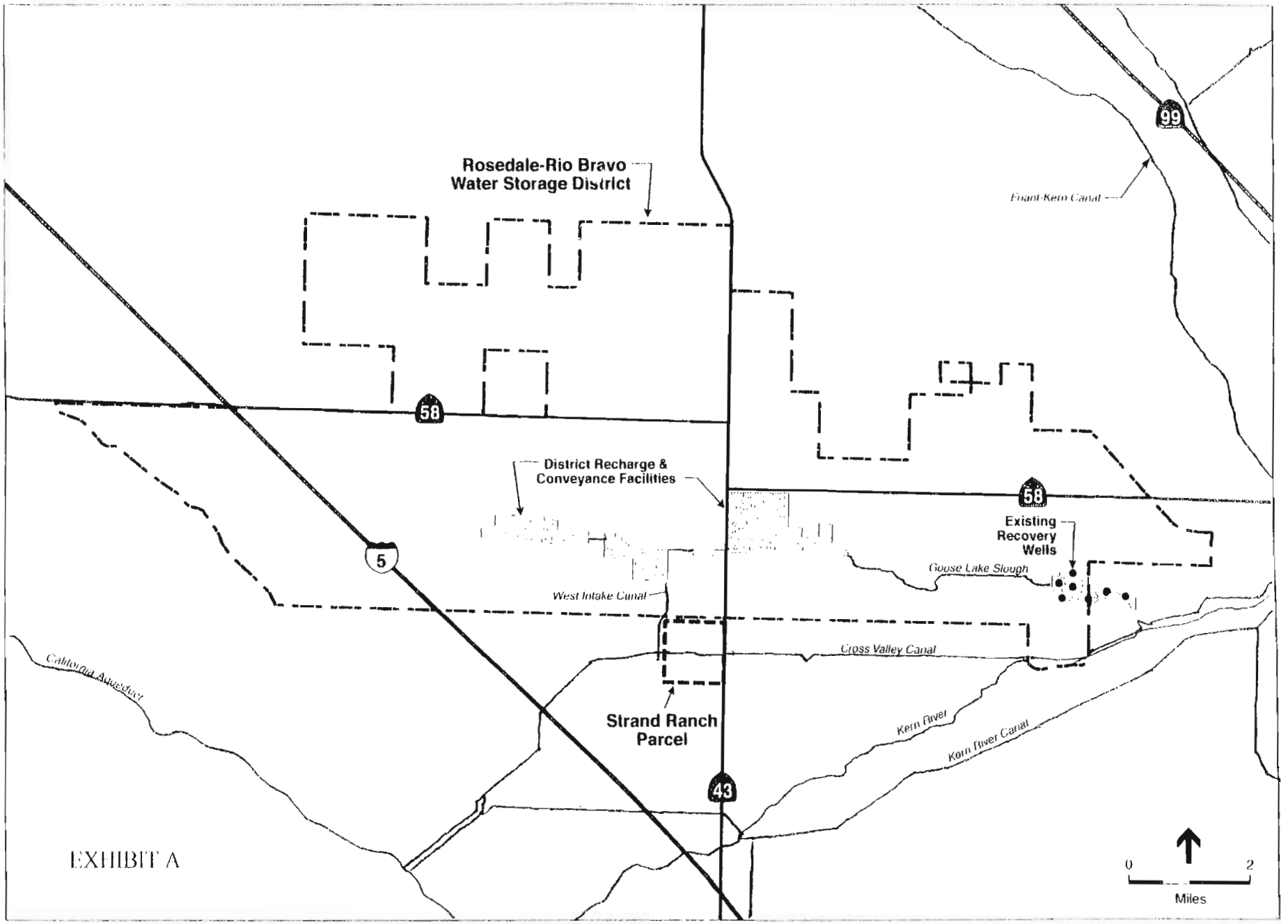

Rosedale-Rio Bravo
Water Storage District
Friant-Kern Canal
99
58
District Recharge &
Conveyance Facilities
58
Existing
Recovery
Wells
Goose Lake Slough
5
West Intake Canal
Cross Valley Canal
California Aqueduct
Strand Ranch
Parcel
Kern River
Kern River Canal
43
0
2
Miles

EXHIBIT A

EXHIBIT B

PROJECT DESCRIPTION

Purposes

The primary water management objective of Rosedale-Rio Bravo Water Storage District is to enhance water supplies for its landowners. One method of attaining this goal is to sponsor third party banking programs. Under such programs surface water will be stored in aquifers during times of surplus and either recovered during times of shortage or remain in the ground to assist with overdraft correction.

Sources of Water

Kern River water, being Rosedale-Rio Bravo WSD's primary supply water right, as well as other sources will be recharged. Such sources include: the Kern River, Friant-Kern, SWP, CVP, flood water and other sources that may be available from time to time.

Facilities

To achieve its water management objectives through third party banking programs, the Rosedale-Rio Bravo Water Storage District may require the construction of recharge ponds, water conveyance facilities, and water wells in addition to its existing facilities.

Of the approximately 43,000 acres that presently constitute Rosedale-Rio Bravo Water Storage District all may be used for in-lieu and/or direct recharge. In addition, adjacent lands within non-districted areas may also be used for in-lieu and direct recharge. It is anticipated that in the wettest of years as much as 300,000 acre-feet can be recharged.

It is proposed that water would be conveyed to and from the property using available capacity in any of the canals and conveyance facilities that may serve the property including: the Cross Valley Canal, the Kern River, the Friant Kern Canal, the California Aqueduct, and the Goose Lake Slough. It is also proposed to build additional conveyance facilities as future projects are developed.

As many as 20 wells may be added within the District boundaries before the project is complete to provide adequate recovery capacity and the necessary operational flexibility to avoid or minimize adverse impacts. District/Landowner programs may include the use of landowner wells by District wide reduction in surface supply allocations or by individual volunteer well lease programs. Once build out of the recovery facilities is complete, the recovery capacity will be maintained by constructing new wells to replace the capacity of older wells as they fail. New District owned wells shall be placed no closer than 880 feet from property and/or District boundaries. Wells inside the District boundaries shall be located and operated so as to prevent significant non-mitigable adverse impacts to neighboring landowners.

Operation

The project shall be managed by the Rosedale-Rio Bravo Water Storage District. Day-to-day operation of portions of the project may be contracted to other parties. Operation of the project shall be coordinated with adjoining projects. The total storage capacity intended to be utilized at any one time for banking project purposes is 500,000 AF and the total recovery capacity intended to be utilized for banking project purposes is 63,250 AF/year.

Banking Projects

The project includes all third party banking programs whether pending or completed. These

programs include, without limitation, the following:

ROSEDALE CONJUNCTIVE USE PROGRAM PARTNERSHIP AGREEMENTS

Banking Partner	Type	Annual Recharge (af)	Maximum Return Obligation (afy)	Maximum Storage (af)	Banked Water Source
Arvin-Edison WSD (draft terms)	2:1 Banking	30,000	10,000	90,000	CVP
Kern-Tulare/Rag Gulch WD	2:1 Banking	20,000	7,500	50,000	varies
Castaic Lake Water Agency	Banking	20,000	20,000*	100,000	varies
Buena Vista WSD	Banking	80,000	8,250	200,000	Kern River
Irvine Ranch Water District	Banking	17,500	17,500	50,000	varies
TOTAL			63,250	490,000	

*surplus capacity of existing wells

A detailed description of each program is found in the environmental documentation relating thereto which includes, without limitation, the following: (1) Master EIR for Groundwater Storage, Banking, Exchange, Extraction and Conjunctive Use Program, certified July 17, 2001; (2) Addendum No. 1 to Master EIR, adopted in 2003; (3) FEIR for the BVWSD/RRBWSD Water Banking and Recovery Program, certified October 11, 2002; (4) Negative Declaration for Kern Tulare Program; (5) Negative Declaration for Groundwater Banking - Allen Road Wellfield (AEWSD) Program; and (6) FEIR for the Strand Ranch Integrated Banking Project (IRWD), certified May 27, 2008.

Addenda

(1) Notwithstanding paragraph 2.b.(10)(a) of this agreement, the surface recharge losses for the Strand Ranch property shall be fixed and assessed at a rate of 6% whether the recharge is intended for in-district or out-of-district use; provided, however, such 6% loss may be modified in the future if studies acceptable to the parties demonstrate that such modification is appropriate; provided further, however, that a 1% safety factor shall be maintained and the total loss when directly recharged water is extracted for out-of-district use shall not exceed 6%.

(2) It is understood and agreed by and among all parties that issues involving project operations may be presented to and addressed by the Monitoring Committee whether or not such issues were discussed, reviewed and/or considered during the environmental evaluation of the project.

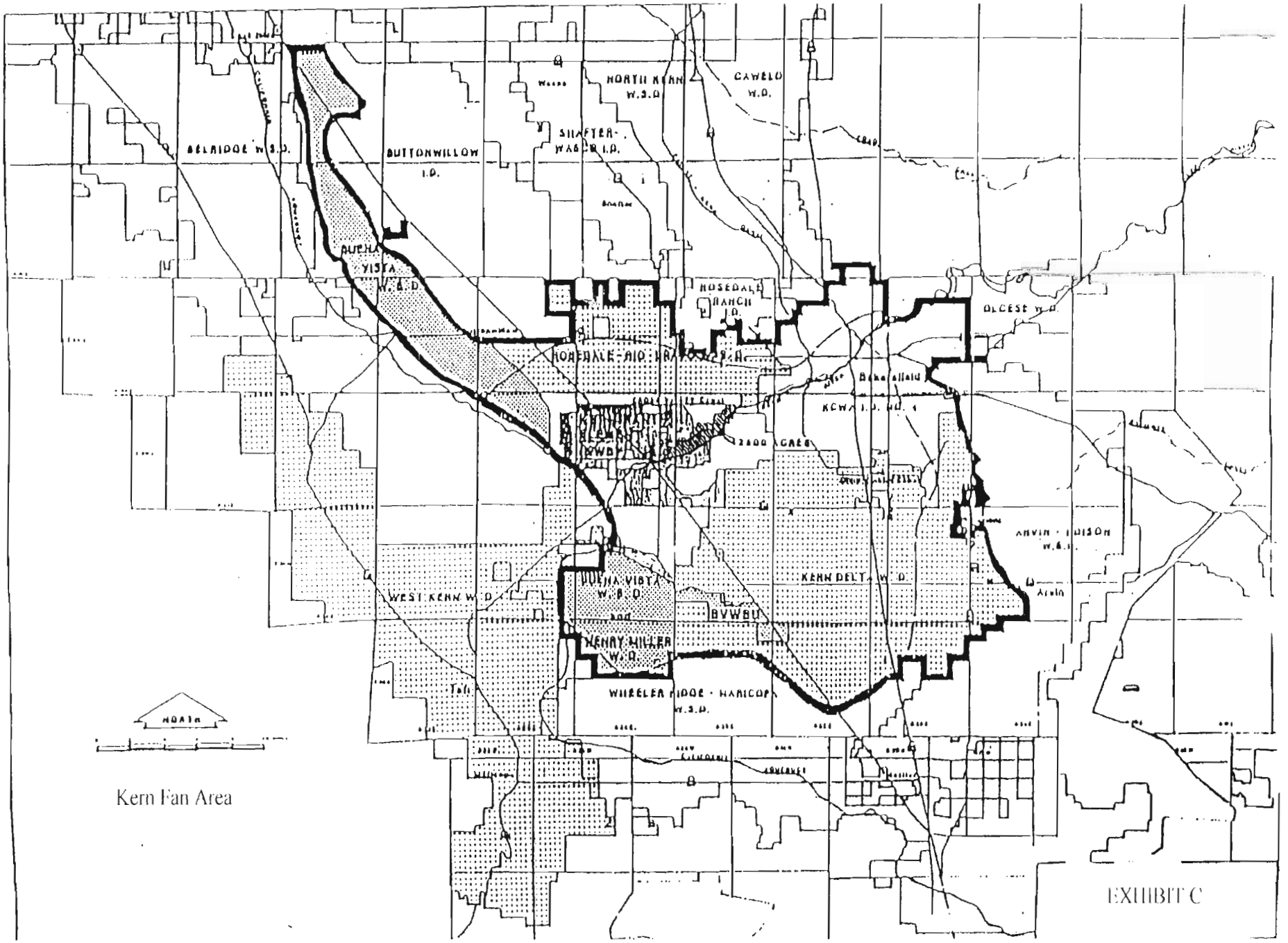

NORTH KERN W.S.D.
CAWELO W.D.
SHAFTER-WASCO I.D.
BELRIDGE W.S.D.
BUTTONWILLOW I.D.
BUENA VISTA W.S.D.
ROSEDALE RANCH I.D.
OLCESE W.D.
ROSEDALE-RIO BRAVO W.S.D.
Bakersfield
KCWA I.D. NO. 4
2800 ACRES
RWD
ARVIN-EDISON W.S.D.
KERN DELTA W.D.
WEST KERN W.D.
BUENA VISTA W.S.D.
BVWSD
HENRY MILLER W.D.
WHEELER RIDGE - MARICOPA W.S.D.
NORTH
Kern Fan Area

EXHIBIT C

Appendix B-2

Memorandum of Understanding
Groundwater Banking and Sale Program

April 30, 2004

Mr. Hal Crossley, General Manager
Rosedale-Rio Bravo Water Storage District
P.O. Box 867
Bakersfield, CA 93302

Re: Memorandum of Understanding, Rosedale-Rio Bravo Water Storage District Groundwater Banking and Sale Program

Dear Mr. Crossley:

Enclosed please find executed copies of the above-referenced Memorandum of Understanding. It is our understanding that this MOU does not in any way modify or amend our letter agreement regarding the banking and sales programs dated December 1, 2003. Please acknowledge that this is also your understanding by signing the acknowledgement below and returning a copy of this letter.

Sincerely,

Thomas N. Clark
General Manager

Being authorized by the district, we agree to the foregoing.

Hal Crossley

Rosedale-Rio Bravo Water Storage District
By Hal Crossley, General Manager
Dated: May 10, 2004

661/634-1400

Mailing Address
P.O. Box 58
Bakersfield, CA 93302-0058

Street Address
3200 Rio Mirada Dr.
Bakersfield, CA 93308

MEMORANDUM OF UNDERSTANDING

REGARDING OPERATION AND MONITORING OF THE ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT GROUNDWATER BANKING AND SALE PROGRAM

This Memorandum of Understanding is entered into the Effective Date hereof by and among **ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT**, hereinafter referred to as "Rosedale", and **ROSEDALE RANCH I.D. OF NORTH KERN WATER STORAGE DISTRICT, SEMITROPIC WATER STORAGE DISTRICT, BUENA VISTA WATER STORAGE DISTRICT, HENRY MILLER WATER DISTRICT, BERRENDA MESA WATER DISTRICT, KERN COUNTY WATER AGENCY, KERN WATER BANK AUTHORITY, IMPROVEMENT DISTRICT NO. 4 KERN COUNTY WATER AGENCY, and WEST KERN WATER DISTRICT**, collectively referred to as "Adjoining Entities."

R E C I T A L S

WHEREAS, Rosedale expects that certain real property more particularly shown on the map attached hereto as Exhibit A and incorporated herein by this reference ("Project Site"), or portions thereof, will be used in connection with the Project; and

WHEREAS, Rosedale intends to develop and improve the Project Site as necessary to permit the importation, percolation and storage of water in underground aquifers for later recovery, transportation and use for the benefit of Rosedale, all as more fully described in Exhibit B attached hereto and incorporated herein by this reference ("Project"); and

WHEREAS, Adjoining Entities encompass lands and/or operate existing projects lying adjacent to the Project Site as shown on said Exhibit A; and

WHEREAS, in recent years, water banking, recovery and transfer programs in Kern County have become increasingly numerous and complex; and

WHEREAS, it is appropriate and desirable to mitigate or eliminate any short-term and long-term significant adverse impacts of new programs upon potentially affected projects and landowners within the boundaries of Adjoining Entities; and

WHEREAS, Adjoining Entities and Rosedale desire that the design, operation and monitoring of the Project be conducted and coordinated in a manner to insure that the beneficial effects of the Project to Rosedale are maximized but that the Project does not result in significant adverse impacts to water levels, water quality or land subsidence within the boundaries of Adjoining Entities, or otherwise interfere with the existing and ongoing programs of Adjoining Entities; and

WHEREAS, on October 26, 1995, the Kern Water Bank Authority and its Member Entities, as the "Project Participants," and Buena Vista Water Storage District, Rosedale-Rio Bravo Water Storage District, Kern Delta Water District, Henry Miller Water District and West Kern Water District, as the "Adjoining Entities," entered into a Memorandum of Understanding, similar to this Memorandum of Understanding, which provided among other things at Paragraph 8 that for "any future project within the Kern Fan Area, the Parties hereto shall use good faith efforts to negotiate an agreement substantially similar in substance to this MOU," and by entering into this MOU the Adjoining Entities find that this MOU satisfies such requirement for the Project; and

WHEREAS, Rosedale intends to operate its Project such that the same does not cause or contribute to overdraft of the groundwater basin; and

WHEREAS, in connection with its environmental review for the Project, Rosedale commissioned a hydrologic balance study for a period of years, which study shows that the District is not currently operating in a state of overdraft, and, further, Rosedale has projected said hydrologic balance study into the future, assuming completion of the Project, and said projection demonstrates that the District is not expected to operate in state of overdraft following implementation of the Project, which studies have not been independently verified by the Adjoining Entities; and

WHEREAS, in the hydrologic balance studies conducted by Rosedale in connection with the Project, the annual safe yield from the groundwater basin is assumed to be .3 acre-feet per acre times the gross developed acres in the District and no assumption is included with respect to groundwater inflow or outflow; and

WHEREAS, this MOU affects the Project and other similar banking programs operated for the benefit of third parties.

NOW, THEREFORE, BE IT RESOLVED that, based upon the mutual covenants contained herein, the parties hereto agree as follows:

1. Project Design and Construction. Rosedale has completed a preliminary Project Description of the Project described in Exhibit B hereto representing the contemplated facilities for the Project. Said preliminary description has been reviewed by the parties hereto. The foregoing shall not be interpreted to imply consent to any aspect of any future project not described in existing approved environmental documentation. Rosedale will construct the Project consistent with such preliminary description. Any major modifications of the facilities and/or significant changes from that described in Exhibit B and in the environmental documentation for the Project will be subject to

additional environmental review pursuant to CEQA and will be subject to review of the Monitoring Committee prior to implementation.

2. Project Operation. The Project shall be operated to achieve the maximum water storage and withdrawal benefits for Rosedale consistent with avoiding, mitigating or eliminating to the greatest extent practicable, significant adverse impacts resulting from the Project. To that end, the Project shall be operated in accordance with the following Project Objectives and Minimum Operating Criteria:

a. Project Objectives. Consistent with the Project description, Rosedale will make a good faith effort to meet the following objectives, which may or may not be met:

(1) The parties should operate their projects in such manner as to maintain and, when possible, enhance the quality of groundwater within the Project Site and the Kern Fan Area as shown in Exhibit C.

(2) If supplies of acceptable recharge water exceed recharge capacity, all other things being equal, recharge priority should be given to the purest or best quality water.

(3) Each project within the Kern Fan Area should be operated with the objective that the average concentration of total dissolved salts in the recovered water will exceed the average concentration of total dissolved salts in the recharged water, at a minimum, by a percentage equal to or greater than the percentage of surface recharge losses. The average shall be calculated from the start of each project.

(4) To maintain or improve groundwater quality, recovery operations should extract poorer quality groundwater where practicable. Blending may be used to increase recovery of lesser quality groundwater unless doing so will exacerbate problems by generating

unfavorable movement of lesser quality groundwater. It is recognized that the extent to which blending can help to resolve groundwater quality problems is limited by regulatory agency rules regarding discharges into conveyance systems used for municipal supplies, which may be changed from time to time.

(5) All groundwater pumpers should attempt to control the migration of poor quality water. Extensive monitoring will be used to identify the migration of poor quality water and give advance notice of developing problems. Problem areas may be dealt with by actions including, but not limited to:

(a) limiting or terminating extractions that tend to draw lesser quality water toward or into the usable water areas;

(b) increasing extractions in areas that might generate a beneficial, reverse gradient;

(c) increasing recharge within the usable water area to promote favorable groundwater gradients.

(6) It is intended that all recovery of recharged water be subject to the so-called "golden rule." In the context of a banking project, the "golden rule" means that, unless acceptable mitigation is provided, the banker may not operate so as to create conditions that are worse than would have prevailed absent the project giving due recognition to the benefits that may result from the project, all as more fully described at paragraph 2(b)12 below.

(7) The Project shall be developed and operated so as to prevent, eliminate or mitigate significant adverse impacts. Thus, the Project shall incorporate mitigation measures as necessary. Mitigation measures to prevent significant adverse impacts from occurring include but

are not limited to the following: (i) spread out recovery area; (ii) provide buffer areas between recovery wells and neighboring overlying users; (iii) limit the monthly, seasonal, and/or annual recovery rate; (iv) provide sufficient recovery wells to allow rotation of recovery wells or the use of alternate wells; (v) provide adequate well spacing; (vi) adjust pumping rates or terminate pumping to reduce impacts, if necessary; (vii) impose time restrictions between recharge and recovery to allow for downward percolation of water to the aquifer; and (viii) provide recharge of water that would otherwise not recharge the Kern Fan Basin. Mitigation measures that compensate for unavoidable adverse impacts include but are not limited to the following: (i) with the consent of the affected groundwater pumper, lower the pump bowls or deepen wells as necessary to restore groundwater extraction capability to such pumper; (ii) with the consent of the affected groundwater pumper, provide alternative water supplies to such pumper; and (iii) with the consent of the affected groundwater pumper, provide financial compensation to such pumper.

b. Minimum Operating Criteria.

(1) The Monitoring Committee shall be notified prior to the recharge of potentially unacceptable water, such as "produced water" from oilfield operations, reclaimed water, or the like. The Monitoring Committee shall review the proposed recharge and make recommendations respecting the same as it deems appropriate. Where approval by the Regional Water Quality Control Board is required, the issuance of such approval by said Board shall satisfy this requirement.

(2) Recharge may not occur in, on or near contaminated areas, nor may anyone spread in, on or near an adjoining area if the effect will be to mound water near enough to the contaminated area that the contaminants will be picked up and carried into the uncontaminated

groundwater supply. When contaminated areas are identified within or adjacent to the Project, Rosedale shall also:

(a) participate with other groundwater pumpers to investigate the source of the contamination;

(b) work with appropriate authorities to ensure that the entity or individual, if any, responsible for the contamination meets its responsibilities to remove the contamination and thereby return the Project Site to its full recharge and storage capacity;

(c) operate the Project in cooperation with other groundwater pumpers to attempt to eliminate the migration of contaminated water toward or into usable water quality areas.

(3) Operators of projects within the Kern Fan Area will avoid operating such projects in a fashion so as to significantly diminish the natural, normal and unavoidable recharge of water native to the Kern Fan Area as it existed in pre-project condition. If and to the extent this occurs as determined by the Monitoring Committee, the parties will cooperate to provide equivalent recharge capacity to offset such impact.

(4) The mitigation credit for fallowed Project land shall be .3 acre-feet per acre per year times the amount of fallowed land included in the Project Site in the year of calculation.

(5) The lands shown in Exhibit A may be utilized for any purpose provided, however, the use of said property by Rosedale for the Project shall not cause or contribute to overdraft of the groundwater basin.

(6) Each device proposed to measure recharge water to be subsequently recovered and/or recovery of such water will be initially evaluated and periodically reviewed by the

Monitoring Committee. Each measuring device shall be properly installed, calibrated, rated, monitored and maintained by and at the expense of the owner of the measuring device.

(7) It shall be the responsibility of the user to insure that all measuring devices are accurate and that the measurements are provided to the Monitoring Committee at the time and in the manner required by the Monitoring Committee.

(8) A producer's flow deposited into another facility, such as a transportation canal, shall be measured into such facility by the operator thereof and the measurement reported to the Monitoring Committee at the time and in the manner required by such Monitoring Committee.

(9) The Monitoring Committee or its designee will maintain official records of recharge and recovery activities, which records shall be open and available to the public. The Monitoring Committee will have the right to verify the accuracy of reported information by inspection, observation or access to user records (i.e., P.G.&E. bills). The Monitoring Committee will publish or cause to be published annual reports of operations.

(10) Losses shall be assessed as follows:

(a) Surface recharge losses shall be fixed and assessed at a rate of 3%, which includes a "safety factor" of 1% of water diverted for direct recharge. An additional surface recharge loss of 3% shall be fixed and assessed against water directly recharged which is subsequently extracted for out-of-district use. Such initial 3% loss may be modified in the future if studies acceptable to the parties demonstrate that such modification is appropriate, providing that a 1% "safety factor" shall be maintained and the total loss when directly recharged water is subsequently extracted for out-of-district use shall not exceed 6%. Notwithstanding anything to the

contrary provided herein, water banked in Rosedale for or on behalf of third parties (~~i.e.~~, creating a third party bank account) shall be subject to surface recharge losses calculated at 6% of water diverted for direct recharge.

(b) To account for all other actual or potential losses (including migration losses), a rate of 4% of water placed in a bank account shall be deducted to the extent that Rosedale has been compensated within three (3) years following the end of the calendar year in which the water was designated as banked at the SWP Delta Water Rate charged by DWR at the time of payment; provided further, however, that the water purchased and subtracted from a groundwater bank account pursuant to this provision shall only be used for overdraft correction within the District purchasing the water.

(c) An additional 5% loss shall be assessed against any water diverted to the Project Site for banking by, for, or on behalf of any out-of-County person, entity or organization (except current SWP Agricultural Contractors).

(d) All losses provided for herein represent amounts of water that are non-bankable and non-recoverable by Rosedale.

(11) Recovery of banked water shall be from the Project Site and recovery facilities shall be located therein. Recovery from outside the Project Site may be allowed with the consent of the District or entity having jurisdiction over the area from which the recovery will occur and upon review by the Monitoring Committee.

(12) Recovery of banked water may not be allowed if not otherwise mitigated if it will result in significant adverse impacts to surrounding overlying users. "Adverse impacts" will be evaluated using data applicable in zones including the area which may be affected

by the Project of approximately five miles in width from the boundaries of the Project as designated by the Monitoring Committee. In determining "adverse impacts," as provided at this paragraph and elsewhere in this MOU, consideration will be given to the benefits accrued over time during operation of the Project to landowners surrounding the Project Site including higher groundwater levels as a result of operation of the Project. In determining non-Project conditions vs. Project conditions, credit toward mitigation of any otherwise adverse impacts shall be recognized to the extent of the 4% loss and 5% losses recognized under paragraphs 2.b.(10)(b) and (c), for the mitigation credit recognized under paragraph 2.b.(4), if any, and to the extent of recharge on the Project Site for overdraft correction.

(13) To the extent that interference, other than insignificant interference, with the pumping lift of any existing active well as compared to non-Project conditions, is attributable to pumping of any wells on the Project Site, Rosedale will either stop pumping as necessary to mitigate the interference or compensate the owner for such interference, or any combination thereof. The Monitoring Committee will establish the criteria necessary to determine if well interference, other than insignificant interference, is attributable to pumping of Project wells by conducting pumping tests of Project wells following the installation of monitoring wells (if not already completed) and considering hydrogeologic information.

(14) The Kern Fan Element Groundwater Model, with input from Rosedale and the Adjoining Entities, and utilizing data from a comprehensive groundwater monitoring program, may be used by the Monitoring Committee as appropriate to estimate groundwater impacts of the Project.

(15) The parties recognize that the Project shall be operated with a positive balance, i.e., there shall be no "borrowing" of water for recovery from the basin.

3. Project Monitoring. Adjoining Entities agree to participate in a comprehensive monitoring program and as members of a Monitoring Committee, as hereinafter more particularly described, in order to reasonably determine groundwater level and water quality information under Project and non-Project conditions. The monitoring program will more particularly require the following:

a. Monitoring Committee: Rosedale and the Adjoining Entities shall form a Monitoring Committee for the Project upon terms and conditions acceptable to the participants. The Monitoring Committee shall:

(1) Engage the services of a suitable independent professional groundwater specialist who shall, at the direction of the Committee, provide assistance in the performance of the tasks identified below;

(2) Meet and confer monthly or at other intervals deemed to be appropriate in furtherance of the monitoring program;

(3) Establish a groundwater evaluation methodology or methodologies;

(4) Prepare a monitoring plan and two associated maps, "Well Location, Water Quality Network," and "Well Location, Water Level Network," which plan and maps depict the location and types of wells anticipated to be used in the initial phase of groundwater monitoring (said plan and maps are expected to be modified from time to time as the monitoring program is developed and operated);

(5) Specify such additional monitoring wells and ancillary equipment as are deemed to be necessary or desirable for the purposes hereof;

(6) Prepare annual water balance studies and other interpretive studies, which will designate all sources of water and the use thereof within the study area;

(7) Develop criteria for determining whether excessive mounding or withdrawal is occurring or is likely to occur in an area of interest;

(8) Annually or as otherwise needed determine the impacts of the Project on each of the Adjoining Entities by evaluating with and without Project conditions; and

(9) Develop procedures, review data, and recommend Project operational criteria for the purpose of identifying, verifying, avoiding, eliminating or mitigating, to the extent practicable, the creation of significant imbalances or significant adverse impacts.

b. Collection and Sharing of Data. The Adjoining Entities will make available to the Monitoring Committee copies of all relevant groundwater level, groundwater quality, and other monitoring data currently collected and prepared by each. Rosedale shall annually report, by areas of interest, water deliveries for banking and other purposes, groundwater withdrawals from bank accounts, transfers and other changes in account balances.

c. Monitoring Costs.

(1) The cost of constructing monitoring wells and ancillary equipment within Rosedale shall be borne by Rosedale. The cost of any new or additional monitoring wells and ancillary equipment outside the boundaries of Rosedale shall be borne as may be determined by separate agreement of Rosedale and Adjoining Entities.

(2) Each of the parties shall be responsible for the personnel costs of its representative on the Monitoring Committee. In addition, the Adjoining Entities shall be responsible for all costs of monitoring operations and facilities within their respective boundaries and Rosedale shall be responsible for all costs of monitoring operations and facilities within the Project Site.

(3) All other groundwater monitoring costs, including employment of the professional groundwater specialist, collection, evaluation and analyses of data as adopted by the Monitoring Committee, shall be allocated among and borne by the parties as they shall agree among themselves. Cost sharing among Adjoining Entities shall be as agreed by them. Any additional monitoring costs shall be determined and allocated by separate agreement of those parties requesting such additional monitoring.

4. Modification of Project Operations. The Monitoring Committee may make recommendations to Rosedale, including without limitation recommendations for modifications in Project operations based upon evaluation(s) of data which indicate that excessive mounding or withdrawal is occurring or is likely to occur in an area of interest. The Monitoring Committee and its members shall not act in an arbitrary, capricious or unreasonable manner.

5. Dispute Resolution.

a. Submission to Monitoring Committee. All disputes regarding the operation of the Project or the application of this MOU, or any provision hereof, shall first be submitted to the Monitoring Committee for review and analysis. The Monitoring Committee shall meet and review all relevant data and facts regarding the dispute and, if possible, recommend a fair and equitable resolution of the dispute. The Monitoring Committee and its members shall not act in an arbitrary, capricious or unreasonable manner. In the event that (1) the Monitoring Committee fails to act as

herein provided, (2) any party disputes the Monitoring Committee's recommended resolution or (3) any party fails to implement the Monitoring Committee's recommended resolution within the time allowed, any party to this MOU may seek any legal or equitable remedy available as hereinafter provided.

b. Arbitration. If all of the parties agree that a factual dispute exists regarding any recommendation of the Monitoring Committee made pursuant hereto, or implementation thereof, such dispute shall, be submitted to binding arbitration before a single neutral arbitrator appointed by unanimous consent and, in the absence of such consent, appointed by the presiding judge of the Kern County Superior Court. The neutral arbitrator shall be a registered civil engineer, registered geologist, or other person agreeable to the parties, preferably with a background in groundwater hydrology. The arbitration shall be called and conducted in accordance with such rules as the contestants shall agree upon, and, in the absence of such agreement, in accordance with the procedures set forth in California Code of Civil Procedure section 1282, et seq. Any other dispute may be pursued through a court of competent jurisdiction as otherwise provided by law.

c. Burden of Proof. In the event of arbitration or litigation under this MOU, all parties shall enjoy the benefit of such presumptions as are provided by law but, in the absence thereof, neither party shall bear the burden of proof on any contested legal or factual issue.

d. Landowner Remedies. Nothing in this MOU shall prevent any landowner within the boundaries of any party from pursuing any remedy at law or in equity in the event such landowner is damaged as a result of projects within the Kern Fan Area.

6. Term. The Effective Date of this MOU shall be January 1, 2003 regardless of the date of actual execution. This MOU shall continue in force and effect from and after the Effective Date

until terminated by (1) operation of law, (2) unanimous consent of the parties, or (3) abandonment of the Project and a determination by the Monitoring Committee that all adverse impacts have been fully eliminated or mitigated as provided in this MOU.

7. Complete Agreement/Incorporation Into Banking Agreements. This MOU constitutes the whole and complete agreement of the parties regarding Project operation, maintenance and monitoring. Rosedale shall incorporate this MOU by reference into any further agreement it enters into respecting banking of water in or withdrawal of water from the Project Site.

8. Future Projects. With respect to any future project within the Kern Fan Area, the Parties hereto shall use good faith efforts to negotiate an agreement substantially similar in substance to this MOU.

9. Notice Clause. All notices required by this MOU shall be sent via first class United States mail to the addresses shown on the signature page of this agreement and shall be deemed delivered three days after deposited in the mail. Notice of changes in the representative or address of a party shall be given in the same manner.

10. California Law Clause. All provisions of this MOU and all rights and obligations of the parties hereto shall be interpreted and construed according to the laws of the State of California.

11. Amendments. This MOU may be amended by written instrument executed by all of the parties. In addition, recognizing that the parties may not now be able to contemplate all the implications of the Project, the parties agree that on the tenth anniversary of implementation of the Project, if facts and conditions not envisioned at the time of entering into this MOU are present, the parties will negotiate in good faith amendments to this MOU. If the parties cannot agree on whether conditions have changed necessitating an amendment and/or upon appropriate amendments to the

MOU, such limited issues shall be submitted to an arbitrator or court, as the case may be, as provided above.

12. Successors and Assigns. This MOU shall bind and inure to the benefit of the successors and assigns of the parties.

13. Severability. The rights and privileges set forth in this MOU are severable and the failure or invalidity of any particular provision of this MOU shall not invalidate the other provisions of this MOU; rather all other provisions of this MOU shall continue and remain in full force and effect notwithstanding such partial failure or invalidity.

14. Force Majeure. All obligations of the parties shall be suspended for so long as and to the extent the performance thereof is prevented, directly or indirectly, by earthquakes, fires, tornadoes, facility failures, floods, drownings, strikes, other casualties, acts of God, orders of court or governmental agencies having competent jurisdiction, or other events or causes beyond the control of the parties. In no event shall any liability accrue against a party, or its officers, agents or employees, for any damage arising out of or connected with a suspension of performance pursuant to this paragraph.

15. Counterparts. This MOU, and any amendment or supplement thereto, may be executed in two or more counterparts, and by each party on a separate counterpart, each of which, when executed and delivered, shall be an original and all of which together shall constitute one instrument, with the same force and effect as though all signatures appeared on a single document. In proving this MOU or any such amendment, supplement, document or instrument, it shall not be necessary to produce or account for more than one counterpart thereof signed by the party against whom enforcement is sought.

IN WITNESS WHEREOF the parties have executed this MOU as of _____,

2004 (Effective Date) at Bakersfield, California.

ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT
P. O. Box 867
Bakersfield, CA 93302-0867

By: _____

By: _____

ROSEDALE RANCH I.D.
NORTH KERN WATER STORAGE DISTRICT
P. O. Box 81435
Bakersfield, CA 93380-1435

By: _____

By: _____

SEMITROPIC WATER STORAGE DISTRICT
P. O. Box Z
Wasco, CA 93280-0877

By: _____

By: _____

BUENA VISTA WATER STORAGE DISTRICT
P. O. Box 756
Buttonwillow, CA

By: _____

By: _____

HENRY MILLER WATER DISTRICT
P. O. Box 9759
Bakersfield, CA 93389-9759

By:_____

By:_____

BERRENDA MESA WATER DISTRICT
2100 F Street, Suite 100
Bakersfield, CA 93301

By:_____

By:_____

KERN COUNTY WATER AGENCY
P. O. Box 58
Bakersfield, CA 93302-0058

By: Gene A. Lundquist

By: President

KERN WATER BANK AUTHORITY
P. O. Box 80607
Bakersfield, CA 93380-0607

By:_____

By:_____

IMPROVEMENT DISTRICT NO. 4
KERN COUNTY WATER AGENCY
P. O. Box 58
Bakersfield, CA 93302-0058

By: Gene A. Lundquist

By: President

WEST KERN WATER DISTRICT
P. O. Box 1105
Taft, CA 93268-1105

By:_____

By:_____

RRB banking MOU - sales included - final.wpd

EXHIBIT 'A'

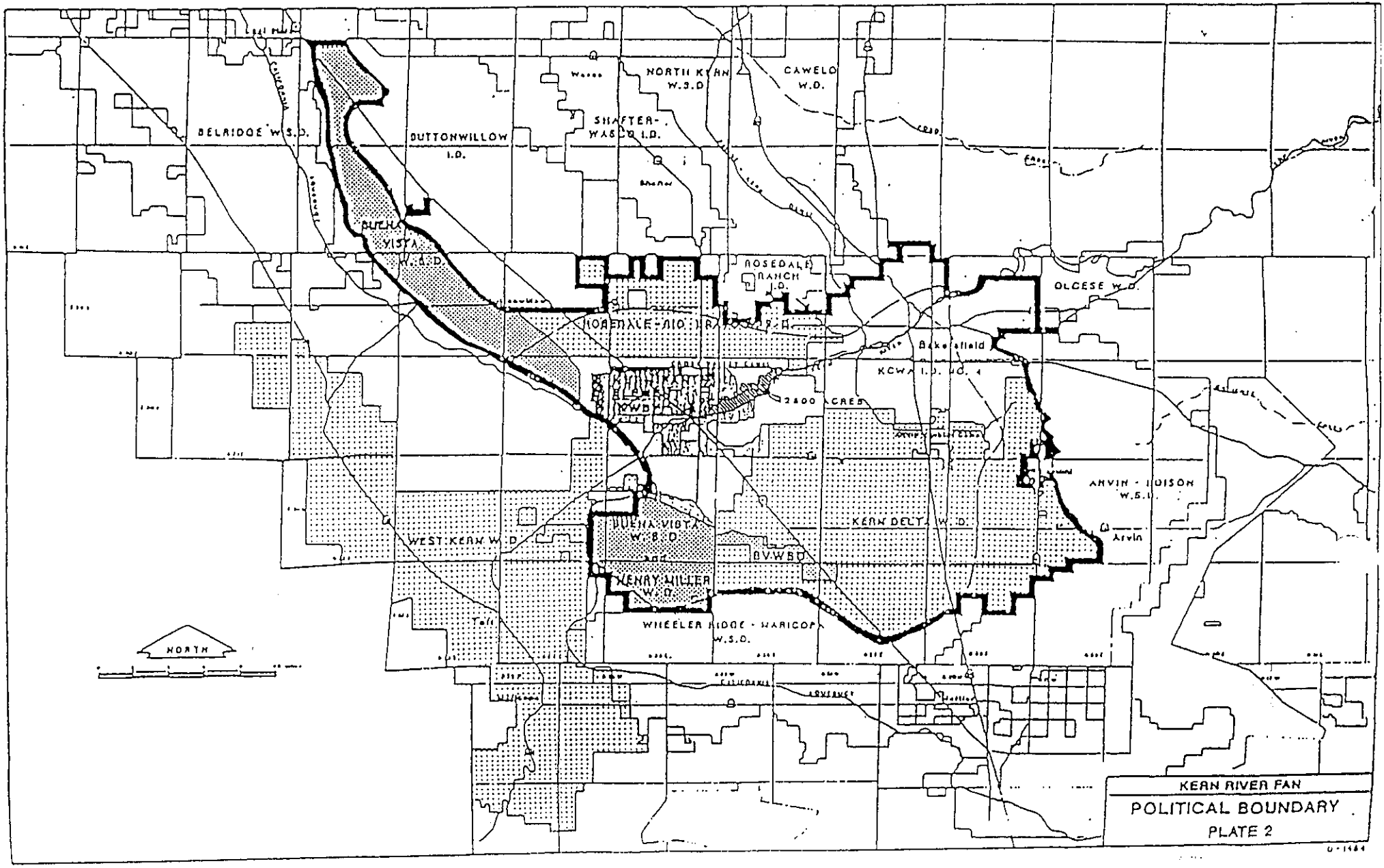

BELRIDGE W.S.D.
BUTTONWILLOW I.D.
NORTH KERN W.S.D
CAWELO W.D.
SHAFTER-WASCO I.D.
BUENA VISTA W.S.D.
ROSEDALE RANCH I.D.
OLCESE W.D.
ROSEDALE-HIGH RANCH W.D.
Bakersfield
KCWA I.D. NO. 4
2800 ACRE
BVWSD
ARVIN - EDISON W.S.D.
Arvin
KERN DELTA W.D.
WEST KERN W.D.
BUENA VISTA W.S.D.
BVWSD
HENRY MILLER W.D.
WHEELER RIDGE - MARICOPA W.S.D.
NORTH
KERN RIVER FAN
POLITICAL BOUNDARY
PLATE 2

EXHIBIT 'B'

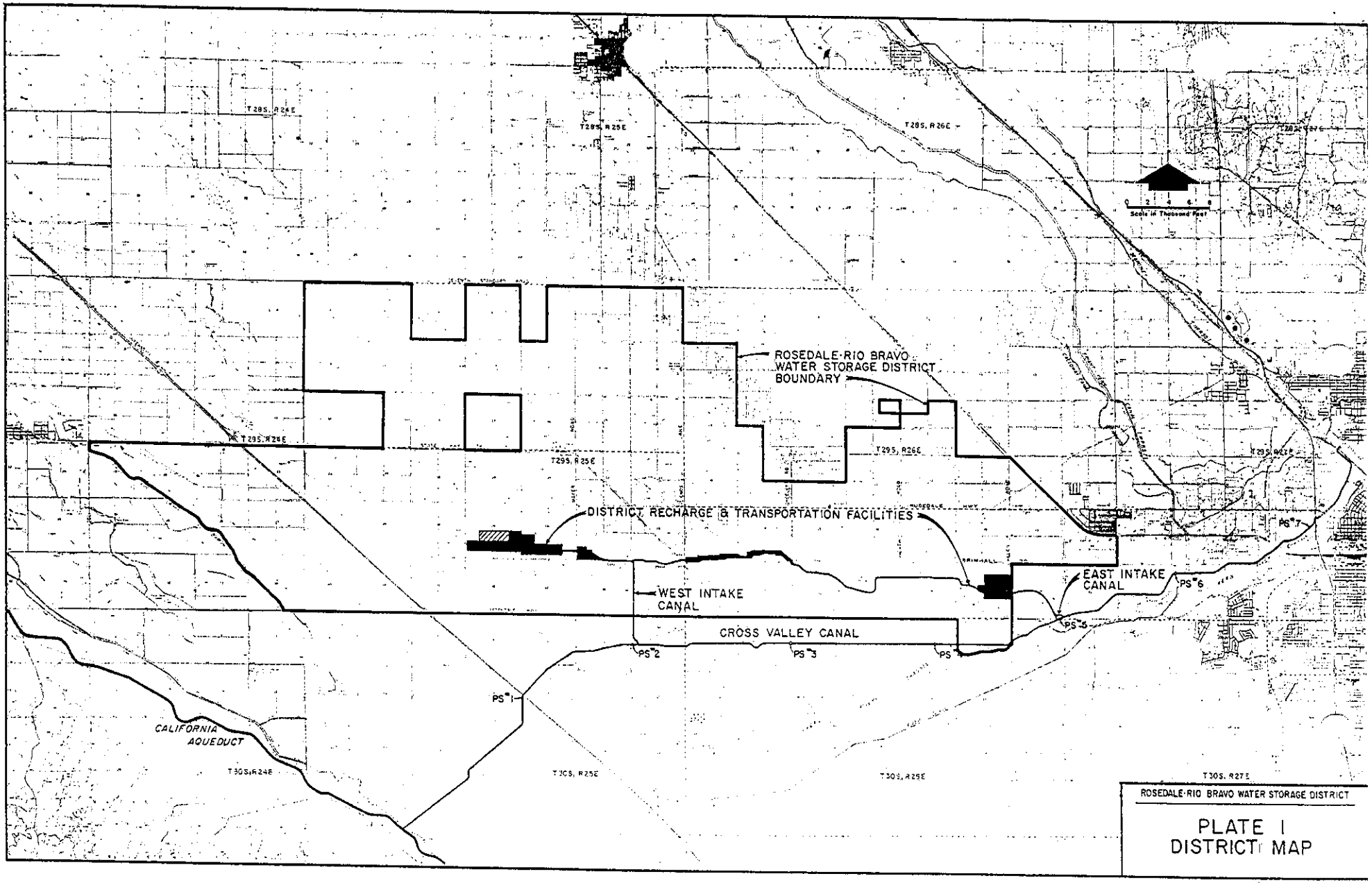
PROJECT DESCRIPTION

The Project involves the recharge, groundwater banking, recovery and sale of water by Rosedale-Rio Bravo Water Storage District (RRBWSD). Kern-Tulare Water District, Arvin-Edison Water Storage District (AEWSD) and other acquired waters will be captured and recharged within the RRBWSD service area. These recharged waters will be banked along with water previously recharged within the Kern River Fan Area by RRBWSD. Waters included in the banking program will originate from imported supplies that RRBWSD is able to put to beneficial use through direct or in-lieu recharge, or from captured local supplies that would have historically left Kern County, percolated into areas of poor quality or unusable groundwater, flooded agricultural land, or would otherwise not have been put to beneficial use within the groundwater basin.

RRBWSD has tentative agreement with Glorious Land Company (GLC). Said agreement calls for the sale and delivery of a total 220,000 acre-feet of water to GLC by RRBWSD over an initial term of 33 years (average 6,667 acre-feet per year). The maximum annual delivery at full build-out will not exceed 9,500 acre-feet. RRBWSD is negotiating a further agreement with The Metropolitan Water District of Southern California (MWD), which is expected to provide that MWD make actual annual deliveries to GLC and RRBWSD provide its water to MWD by way of exchange. Under the terms of the proposed MWD agreement, MWD may take direct delivery of water from RRBWSD annually or may choose to store water in RRBWSD. If and to the extent that the storage option is exercised, MWD will be limited to 60,000 acre-feet maximum storage at any one time and 20,000 acre-feet maximum annual delivery (which amount is inclusive of and not in addition to the 9,500 acre-feet maximum annual delivery provided in the letter of intent).

RRBWSD will improve District-owned lands in the South½ of Section 25, T29S, R25E, MDB&M to add approximately 80 net acres of additional recharge ponds for project purposes. RRBWSD will construct approximately 10 additional extraction wells (8 new and 2 replacement wells) in RRBWSD's west-side well field. A pipeline will be constructed to connect the wells to the District's system and the Cross Valley Canal. RRBWSD will acquire and improve additional lands to increase the District's recharge capacity to 600 cfs.

EXHIBIT 'C'



ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT

PLATE 1
DISTRICT MAP

Appendix B-3

Long Term Project Recovery Operations Plan

LONG TERM PROJECT RECOVERY
OPERATIONS PLAN
REGARDING ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT PROJECTS

Purpose.

Consistent with Rosedale-Rio Bravo Water Storage District's (Rosedale) Memorandums of Understanding governing its banking projects (MOUs), this Long Term Operations Plan Regarding Rosedale-Rio Bravo Water Storage District Projects ("Plan") designates specific measures to be employed to *"... prevent, eliminate or mitigate significant adverse impacts"* resulting from project operations within areas of concern (AOC's). All Rosedale projects which are subject to an MOU with adjoining entities shall be subject to and operated consistent with this Plan. Rosedale will carry out its duties and responsibilities under this Plan in good faith and in cooperation with its landowners, to the end that the objectives and purposes of this Plan will be achieved and/or carried out to the greatest extent practicable.

Plan Components:

A. Establish a Protocol for Monitoring and Reporting Groundwater Conditions to the Board of Directors and the Public.

1. During years when Rosedale is recovering (or is expected to recover) groundwater from a Rosedale project, Rosedale will conduct monitoring of groundwater conditions, as necessary, in addition to the monitoring conducted by the Kern Fan Monitoring Committee (pursuant to the MOUs), and provide reports on groundwater levels as described below.
2. Rosedale will report current groundwater levels to its Board of Directors at each monthly regular meeting, and will make the reports available to the public on its website (http://www.rrbwsd.com/).
3. Rosedale will regularly update its Groundwater Model (Model) to actual conditions and use the Model to project future groundwater conditions. Rosedale will endeavor to use the best and latest science and information available in all modeling and technical matters. Rosedale will report the results of its modeling to its Board of Directors and will make the results available to the public on its website (http://www.rrbwsd.com/). Recovery in any calendar year shall not commence until the Model has been run for projected operations and the results have been reported to the Board and made available to the public.

B. Implement Proactive Measures (in addition to A. above).

1. Rosedale will be obligated to collect and/or contribute funds to meet mitigation obligations hereunder (**"Action Fund")**, which shall be initially set at $2.00/AF

of recovered water from all prospective project operations (actually pumped, not exchanged), until the Action Fund balance reaches $_____. If the Action Fund balance drops below $_____ contributions shall be resumed until the Action Fund balance again reaches $_____. In addition, Rosedale shall initially provide $50,000 to the Action Fund. Rosedale shall maintain an accounting of funds and shall serve as fiscal agent for the Action Fund; Rosedale shall report the balance of the fund to its Board of Directors at its regular monthly meetings.

2. Rosedale will use its Model as a tool to evaluate groundwater impacts resulting from its project operations. The Model will be periodically run and updated as projected recovery plans become known or change and the Model will assume such conditions.
3. The Model has been and will be used to:
   (a) Forecast groundwater levels.
   (b) Forecast and predict the contribution of Rosedale's projects to groundwater level declines in the area.
   (c) Determine water level conditions in the "No Project" Condition for purposes of evaluating the impact of project operations. The "No Project" condition is the water level that would have been at any particular well location absent the Rosedale project.
   (d) Identify, based upon an analysis of "No Project" and Project conditions, if a **negative project impact ("NPI")** has or is likely to occur for which the measures described at D, E, F and G may be operative. NPI is determined according to C., 2., below.
   (e) Forecast any localized areas for special attention and/or monitoring, i.e., AOC's.
   (f) Identify wells at risk of impacts during recovery operations.

C. Establish Triggers and Actions within any identified AOC.

As described below at sections D, E, F, and G, these actions will be implemented in consultation with affected landowners that make a claim to Rosedale of well impacts relating to Rosedale's recovery operations and groundwater level declines. The triggers and actions below are for wells within any identified AOC, subject to the following:

.

1. These actions would not occur in years when average water levels (measured at the following wells: 29S/25E-27N1&2, 29S/25E-25M1&2, 29S/26E-31H1&2, and 29S/25E-35G01) are less than 140 feet from the surface as measured on March 31 of each year because it is expected that water levels will not decline during such year to an extent resulting in adverse impacts to wells.
2. The trigger for whether mitigation is warranted shall be based upon an analysis

and comparison of Model generated "No Project" conditions to Model generated "Project" conditions. When the Project conditions are 30 feet deeper than the No Project conditions at an operative well, and the well has (or is expected to) experience mechanical failure or other operational problems due to declining water levels, a negative project impact ("NPI") is triggered.

3. It is the intent of Rosedale to mitigate and/or compensate for legitimate Project impacts; it is not the intent of the Rosedale or the Plan to generate a windfall for landowners. Accordingly, reasonable adjustments in the form or level of mitigation and/or compensation may be made where it can be demonstrated that the affected well requires remediation for reasons other than temporary groundwater level declines resulting from Project operations (i.e., general overdraft conditions, lack of well maintenance, normal wear and tear, failure of well equipment, casing degradation, etc.).

4. For a well owner to be eligible for mitigation as provided below, the affected landowner shall submit a claim to Rosedale, which shall, at a minimum, provide information concerning the condition of the well and casing and pumping equipment of the well, and other information that is relevant to the landowner's claim. Upon receipt of a claim, Rosedale shall use the Model (or the results of modelling as reported to the Board and the public) to determine whether an NPI exists at the landowner's well and respond with the appropriate action described below.

D. Action for Ag Wells – Well Adjustment Needed and Available

1. Trigger: When the Model predicts NPI for an operational ag well outside the current operating range of the pump but within the potential operating range of the well.
2. Actions:
   (a) Field verify (with the affected landowner if requested) static depth to groundwater levels within the well and compare to Model values.
   (b) Compare pump setting information with Model projected pumping water levels throughout the year to determine pump submergence levels and evaluate the necessity and feasibility of lowering the well pump to meet the landowner's needs.
   (c) Secure an estimate to complete the necessary work.
   (d) Using the Action Fund, pay all costs associated with the landowner claim, including the cost to complete the necessary work (less negotiated offsets), upon the landowner executing a release.

E. Action for Ag Wells – Well Adjustment Unavailable

1. Trigger: When the Model predicts NPI for an operational ag well outside the current and potential operating range of the well.
2. Action:
   (a) Field verify (with the affected landowner if requested) static depth to groundwater levels within the well and compare to Model values.
   (b) Supply equivalent water supply to the affected landowner from an alternate source at no greater cost to the affected landowner; or
   (c) With the consent of the affected landowner, provide other acceptable mitigation; or
   (d) Reduce or adjust pumping as necessary to prevent, avoid or eliminate the NPI. Use the Model(s) to identify the well or wells that may require reduction or adjustment in pumping.

F. Action for Domestic Wells.

1. Trigger: Emergency health and safety concerns exist because a domestic well production ceases or is likely to cease as a result of pumping by Rosedale's project.
2. Actions:
   (a) Field verify (with the affected landowner if requested) if flow stoppage is due to groundwater level decline.
   (b) Obtain right-of-entry permit and well data release from well owner.
   (c) Collect pump manufacture data, the in-situ pump setting and the casing depth information.
   (d) If it is determined that no NPI exists at the well, or if flow stoppage is due to causes unrelated to groundwater level decline (i.e., pump failure, casing degradation, etc.) repairs are the responsibility of the landowner.
   (d) If flow stoppage is due to groundwater level decline in the aquifer proximate to the impacted well and an NPI exists at the well, offer to fund from the Action Fund one of the following in order to provide the least cost short and long term solution:
      (1) Lower the domestic submersible pump bowl setting sufficient to restore and maintain service.
      (2) Provide a one-time permanent connection to the nearest water service provider.
      (3) Drill and equip a new domestic well, the cost of which may be subject to offset by the landowner based on betterment.
      (4) If necessary, provide interim in-home water supplies until action (1), (2) or (3) above is completed.
   (e) Using the Action Fund, pay all costs associated with the landowner claim, including the cost to complete the necessary work (less negotiated offsets), upon the landowner executing a release.

G. Action for Other Landowner Claims.

1. Trigger: A landowner makes a claim of impact on his groundwater use (which could be due to Rosedale's projects, adjacent landowners, or a combination) that does not relate to the actual (or likely) cessation of production at a well.
2. Actions:
   (a) Refer claim to the Board of Directors to evaluate and respond to landowner claim at its next regularly scheduled meeting.
   (b) Process claim according to agreed upon dispute resolution process (e.g., mediation, arbitration, etc.) in the event the affected landowner does not agree with the Board of Directors' response.

H. Release; Rosedale's Rights Against Others

In all instances when Rosedale takes action to mitigate the effects of declining groundwater levels under this Plan, the affected landowner shall be required to execute an appropriate release in favor of Rosedale. Nothing in this Plan or any action taken by Rosedale hereunder shall affect Rosedale's rights or remedies against any other person or entity (e.g., adjacent landowners, other recovery projects in the area and participants in such projects, etc.) which may have caused or contributed to the effects for which Rosedale has mitigated; if appropriate, an affected landowner that receives assistance from Rosedale hereunder shall assign its rights against such other person(s) or entity(ies) to Rosedale.

Appendix B-4

Interim Project Recovery Operations Plan

INTERIM PROJECT RECOVERY
OPERATIONS PLAN
REGARDING KERN WATER BANK AUTHORITY (KWB) AND ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT (ROSEDALE) PROJECTS

Purpose.

Consistent with the MOUs governing their respective projects, this interim Operations Plan ("Plan") designates measures to be employed to *"... prevent, eliminate or mitigate significant adverse impacts"* resulting from project operations within areas of concern (AOC's).

Projects included within this Plan are the following:

1. Kern Water Bank Project.

2. All Rosedale Projects which are subject to an MOU wherein the KWBA is a signatory as an "adjoining entity."

Plan Components:

A. Establish a separate KWB/Rosedale Operations Plan Implementation Committee ("Joint Operations Committee") for the following purposes.

1. The Joint Operations Committee will be separate from the Kern Fan Monitoring Committee. Rosedale and the KWBA will jointly participate in the Joint Operations Committee. Each party will have equal representation on the Joint Operations Committee and an equal voice in its determinations. The Parties will agree on an appropriate level of Director participation.

2. The Committee will not duplicate the water quality and water level monitoring conducted by the Kern Fan Monitoring Committee, but conduct additional monitoring as needed.

3. The Committee will regularly update and compare the AMEC and Harder Models to actual conditions; and for purposes of making determinations hereunder an average of the output for the two models shall be utilized. The Joint Operations Committee may, based on experience gained, select and regularly update a mutually agreeable groundwater model capable of accurately predicting groundwater impacts resulting from project operations ("Model"). As a matter of practice, the Committee will use the best and latest science and information available in all modeling and technical matters. In case of a dispute concerning a model or its application, the Parties shall consult with a third party to resolve the matter.

4. Provide status of groundwater conditions, pumping rates and volumes, and model projections to each entity to identify any developing problems.

5. Provide a forum for and facilitate discussions within any localized area of concern ("AOC").

6. Fund the actions described below at D, E, F and G in recognition of the joint impact (both positive and possibly negative) on landowners by both the KWB and Rosedale banking projects.

B. Implement Proactive Measures (in addition to A. above).

1. KWBA and Rosedale will be obligated to contribute funds to meet mitigation obligations hereunder ("Action Fund"), which shall be $2.00/AF of recovered water from future project operations (actually pumped, not exchanged), until the Action Fund balance reaches $1.0 million. If the Action Fund balance drops below $500,000 contributions shall be resumed until the Action Fund balance again reaches $1.0 million. In addition, KWBA and Rosedale shall initially provide $250,000 and $50,000, respectively. Rosedale shall maintain an accounting of funds obligated by the parties and shall serve as fiscal agent for the Action Fund. As actions are taken by the Joint Operations Committee pursuant to D, E, F and G, the fiscal agent shall invoice to the extent funds are obligated to the Action Fund, and each shall remit the requested funds within 30 days of invoice.

2. KWBA and Rosedale will use the Models as a tool to evaluate groundwater impacts as well as the With Project verses Without Project groundwater levels. For purposes of this Plan, the Parties have agreed the Without Project Condition shall assume no farming on the KWB lands and the KWB shall receive a basin credit of 6,000 acre-feet per year. The Models will be periodically run and updated as the Parties projected recovery plans become known or change and With Project conditions will assume such conditions. Recovery in any calendar year shall not commence until the Models have been run for the projected operations and the Committee has met to review the results.

3. The models have been and will be used to:

   (a) forecast groundwater levels.

   (b) forecast when With Project water levels become deeper than Without Project water levels (with both KWB and Rosedale projects). For purposes of this plan a condition shall be considered a negative project impact ("NPI") for which the measures described at D, E, F and G may be

operative where the With Project water level is 45 feet deeper than the Without Project water level, as forecasted by the Model.

(c) forecast any localized areas for special attention and/or monitoring, i.e., AOC's.

(d) identify domestic wells at risk of impacts.

4. KWBA and Rosedale will jointly research potential emergency response for domestic well health and safety issues within Rosedale and Buena Vista and jointly respond as described below at F.

5. The Joint Operations Committee will:

(a) establish a process to respond to and evaluate landowner claims associated with Project operations.

(b) determine whether landowner outreach should be proactive, reactive or both.

6. In the event the Joint Operations Committee cannot agree on the implementation of this agreement or the proper action in response to a landowner claim, such dispute shall be submitted to binding arbitration before a single neutral arbitrator appointed by the Parties, and in absence of such consent, appointed by the presiding judge of the Kern County Superior Court. The arbitration shall be called and conducted in accordance with such rules as the Parties shall agree upon, and if the absence of such agreement, in accordance with the procedures set forth in California Code of Civil Procedure section 1282, et seq. The parties shall attempt to jointly appoint the neutral arbitrator within ten days after a dispute arises, and in the event the parties cannot agree to a neutral arbitrator within said ten-day period, either party may make a request to the presiding judge of the Kern County Superior Court immediately thereafter. Notwithstanding the time periods prescribed by the Code of Civil Procedure section 1282, et seq., all arbitration conducted hereunder shall be commenced within thirty days of the selection of the neutral arbitrator, unless agreed to otherwise by the Joint Operations Committee and the affected landowner, if any. The dispute resolution process selected by the Parties shall be the exclusive remedy for landowners agreeing to participate in and receive the benefits hereunder.

7. With respect to the interpretation and enforcement of this Plan, and with respect to the resolution of any matter left for future determination or implementation, the Parties agree to carry out such duties and responsibilities in good faith and in cooperation with one another, to the end that the objectives and purposes of this agreement will be achieved and/or carried out to the greatest extent practicable.

C. Establish Triggers and Actions within any identified AOC.

As described below at sections D, E, F, and G, these actions will be implemented in consultation with the Parties through the Joint Operations Committee. The triggers and actions below are for wells within any identified AOC, subject to the following:

1. These actions would not occur in years when average water levels (measured at the following wells: 29S/25E-27N1&2, 29S/25E-25M1&2, 29S/26E-31H1&2, and 29S/25E-35G01) are less than 140 feet from the surface as measured on March 31 of a given year because it is expected that water levels will not decline during such year to an extent resulting in an NPI.

2. It is the intent of the Parties to mitigate and/or compensate for legitimate Project impacts; it is not the intent of the Parties or the Plan to generate a windfall for landowners. Accordingly, reasonable adjustments in the form or level of mitigation and/or compensation will be made where it can be demonstrated that the affected well requires remediation for reasons other than temporary groundwater level declines resulting from Project operations (i.e., general overdraft conditions, lack of well maintenance, normal wear and tear, failure of well equipment, etc.).

3. For agricultural wells to be eligible for mitigation as provided below, the affected landowner shall provide information concerning the condition of the well and casing and pumping equipment, as determined appropriate by the Joint Operations Committee.

D. Action for Ag Wells – Well Adjustment Needed and Available

1. Trigger: When the Model predicts NPI for an operational ag well outside the current operating range of the pump but within the potential operating range of the well.

2. Actions:

   (a) Jointly field verify static depth to groundwater levels within the well and compare to Model values.

   (b) Compare pump setting information with Model projected pumping water levels throughout the year to determine pump submergence levels and evaluate the necessity and feasibility of lowering the well pump to meet the landowner's needs.

   (c) Secure an estimate to complete the necessary work.

(d) Using the Action Fund, pay all costs associated with the landowner claim, including the cost to complete the necessary work (less negotiated offsets), upon the landowner executing a release.

E. Action for Ag Wells – Well Adjustment Unavailable

1. Trigger: When the Model predicts NPI for an operational ag well outside the current and potential operating range of the well.

2. Actions:

(a) Jointly field verify static depth to groundwater levels within the well and compare to Model values.

(b) Supply equivalent water supply to the affected landowner from an alternate source at no greater cost to the affected landowner; or

(c) With the consent of the affected landowner, provide other acceptable mitigation; or

(d) Reduce or adjust pumping as necessary to prevent, avoid or eliminate the NPI. Use the Model(s) to identify the well or wells that may require reduction or adjustment in pumping. The Parties agree to share available Project water supplies in a manner such that the burden of reduced pumping shall be borne by the Parties in proportion to the Model(s) projection of their respective impacts.

F. Action for Domestic Wells.

1. Trigger: Emergency health and safety concerns exist because a domestic submersible pump production ceases or is likely to cease as a result of pumping by either or both of the Parties' Projects.

2. Actions:

(a) Jointly field verify if flow stoppage is due to groundwater level decline.

(b) Obtain joint right-of-entry permit and well data release from well owner.

(c) Collect pump manufacture data, the in-situ pump setting and the casing depth information.

(d) If flow stoppage is due to causes unrelated to groundwater level decline (i.e., pump failure, casing degradation, etc.) repairs are the responsibility of the landowner.

(e) If flow stoppage is due to groundwater level decline in the aquifer proximate to the impacted well, regardless of cause, offer to fund from the Action Fund one of the following, as determined by the Joint Operations Committee, if possible, in order to provide the least cost short and long term solution:

(1) Lower the domestic submersible pump bowl setting sufficient to restore and maintain service.

(2) Provide a one-time permanent connection to the nearest water service provider.

(3) Drill and equip a new domestic well. Joint Operating Committee to decide if the landowner should contribute based on betterment.

(4) If necessary, provide interim in-home water supplies until action (1), (2) or (3) above is completed.

(f) Using the Action Fund, pay all costs associated with the landowner claim, including the cost to complete the necessary work (less negotiated offsets), upon the landowner executing a release.

G. Action for Other Landowner Claims.

1. Trigger: A landowner makes a claim of impact on his groundwater use (which could be due to the projects, adjacent landowners, or a combination)

2. Actions:

(a) Refer claim to the Joint Operations Committee to evaluate and respond to landowner claim.

(b) Process claim according to agreed upon dispute resolution process (see B.6., above) in the event the Joint Operations Committee does not agree on an appropriate response.

H. Additional Actions and Miscellaneous.

1. Subject to H.3, this interim operations Plan will become effective on September 5, 2014.

2. The Joint Operations Committee will evaluate and, if appropriate, mitigate 2010 landowner claims according to the process set forth in this Plan, provided the claims have not been dismissed or are intended to be dismissed in the pending Pioneer Litigation.

3. Petitioners Rosedale and Buena Vista Water Storage District shall support and not object to this Plan in any and all of its filings and argument for the remedies hearing(s) in *Rosedale v. DWR* and *CDWA v. DWR*, currently set for September 5, 2014. The effectiveness of this Plan is conditioned on issuance of a remedy order by the Court pursuant to CEQA and Public Resources Code section 21168.9 that does not restrict KWB operations, while DWR is conducting further CEQA review of same, provided the operations are conducted subject to the Plan. This Plan shall be in effect until DWR's certification of its environmental document prepared in response to the Court's order in *Rosedale v. DWR* and *CDWA v. DWR*, and filing of its Return to Writ in such proceeding. The parties have negotiated a remedy order in the form of a peremptory writ which incorporates this Operations Plan and which will be jointly presented to the Court for signature. If the Court accepts the negotiated peremptory writ in the form presented and issues a judgment consistent with the same in both cases, then the Kern Water Bank Authority and its member entities waive any right to appeal or challenge both (i) the peremptory writ and (ii) the order on which it is based (i.e., March 5, 2014 decision in *Rosedale-Rio Bravo Water Storage District, et al. vs. Department of Water Resources, et al.*).

4. This interim Plan is not intended to and shall not establish any precedent for the supplemental environmental document DWR is required to prepare in *Rosedale v. DWR* and *CDWA v. DWR,* or its compliance with CEQA, including, but not limited to, with respect to the appropriate baseline(s), significance threshold(s), and what appropriate mitigation measure(s), if any, should apply following the term of this interim Plan. Nothing in this Plan is intended to act or be construed as a waiver of the parties respective rights to challenge any increase in facilities or operations of the other parties, either in the *Rosedale v. DWR* action (pursuant to the continuing jurisdiction of the Court), or in other legal proceedings, as appropriate.

5. While this Plan is in effect, KWBA may repair or replace existing facilities but shall not take any action that would increase or augment their ability to recover water beyond their existing capacity, as of the date of this Plan, to and including not increasing the horsepower of any well beyond that currently in place. KWBA shall provide Rosedale and Buena Vista a copy of energy statements demonstrating the horsepower of each well operational on the KWBA and provide access to Buena Vista and Rosedale to physically inspect each well. Additionally, the three new wells to be constructed by the KWBA as part of the IRWMP grant program shall be replacement wells with the KWBA to eliminate production from at least one well located within 1.5 miles of Stockdale Highway. Further, the three replacement wells shall be not be constructed within 1.5 miles of Stockdale Highway, and shall not be subject to the horsepower limitations provided above.

6. This agreement will not prejudice petitioners' (Rosedale and/or Buena Vista's) right to claim costs and reasonable attorneys' fees incurred in connection with the *Rosedale v. DWR* litigation. Nothing herein shall be construed as a waiver of any party's right to appeal from any order regarding the recovery of attorneys' fees.

APPROVED this ___day of _____, 2014

KERN WATER BANK AUTHORITY

By_____

ROSEDALE-RIO BRAVO WATER STORAGE DISTIRCT

By_____

BUENA VISTA WATER STORAGE DISTRICT

By_____

Appendix C

Air Quality URBEMIS Output Data Sheets

IRWD Stockdale West Joint Banking

Kern-San Joaquin County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	200.00	Acre	200.00	8,712,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	32
Climate Zone	3			**Operational Year**	2018
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Parking land use input as representative of the basins. 200 acres assumed to be disturbed on Stockdale East.

Construction Phase - 6 phases, 6 months per phase per the Project Description; Construction anticipated to begin in summer 2015.

Off-road Equipment - Mix of tractors/loaders/backhoes (4) and trencher (1) assumed for Central Intake Canal construction

Off-road Equipment - Default equipment for Grading

Off-road Equipment - Default equipment for Site Prep

Off-road Equipment - Added a bore/drill rig to the default equipment for Well Construction

Off-road Equipment - Mix of tractors/loaders/backhoes (3), crane (1), trencher (1), generator (1), and welders (2) assumed for Wellhead/Pipeline construction

Trips and VMT - Assumes average of 20 workers and 1 delivery truck per day

On-road Fugitive Dust - Assumed 95 % of on-road vehicle travel would be on paved roads

Grading - 200 acres total disturbed, no soil import/export assumed

Consumer Products - Consumer products not applicable to project

Area Coating - No architectural coatings anticipated

Landscape Equipment - Natural grazing rather than landscape equipment

Construction Off-road Equipment Mitigation - Mitigations applied: water 2x/day, limit vehicle speed to 15 mph on unpaved roads

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Interior	13068000	0
tblConstructionPhase	NumDays	3,100.00	261.00
tblConstructionPhase	NumDays	310.00	109.00
tblConstructionPhase	NumDays	120.00	24.00
tblConstructionPhase	PhaseStartDate	12/31/2016	1/1/2017
tblGrading	AcresOfGrading	272.50	200.00
tblGrading	AcresOfGrading	0.00	200.00
tblOnRoadDust	HaulingPercentPave	100.00	95.00
tblOnRoadDust	HaulingPercentPave	100.00	95.00
tblOnRoadDust	HaulingPercentPave	100.00	95.00
tblOnRoadDust	HaulingPercentPave	100.00	95.00
tblOnRoadDust	HaulingPercentPave	100.00	95.00
tblOnRoadDust	VendorPercentPave	100.00	95.00
tblOnRoadDust	VendorPercentPave	100.00	95.00
tblOnRoadDust	VendorPercentPave	100.00	95.00
tblOnRoadDust	VendorPercentPave	100.00	95.00
tblOnRoadDust	VendorPercentPave	100.00	95.00
tblOnRoadDust	WorkerPercentPave	100.00	95.00
tblOnRoadDust	WorkerPercentPave	100.00	95.00
tblOnRoadDust	WorkerPercentPave	100.00	95.00
tblOnRoadDust	WorkerPercentPave	100.00	95.00
tblOnRoadDust	WorkerPercentPave	100.00	95.00
tblProjectCharacteristics	OperationalYear	2014	2018
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripNumber	0.00	2.00

tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	1,428.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripNumber	18.00	40.00
tblTripsAndVMT	WorkerTripNumber	20.00	40.00
tblTripsAndVMT	WorkerTripNumber	3,659.00	40.00
tblTripsAndVMT	WorkerTripNumber	20.00	40.00
tblTripsAndVMT	WorkerTripNumber	13.00	40.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.4470	5.0254	3.5028	4.2900e-003	3.8489	0.2448	4.0937	0.6364	0.2252	0.8617	0.0000	401.0302	401.0302	0.1109	0.0000	403.3586
2016	0.5153	4.4646	3.0660	5.5300e-003	6.0674	0.2778	6.3452	0.6161	0.2606	0.8767	0.0000	490.8567	490.8567	0.1140	0.0000	493.2499
2017	0.5039	3.8856	2.9806	4.8000e-003	6.0442	0.2549	6.2991	0.6138	0.2403	0.8541	0.0000	409.4303	409.4303	0.0876	0.0000	411.2695
2018	0.1107	0.9920	0.9449	1.4900e-003	3.0453	0.0703	3.1156	0.3092	0.0647	0.3739	0.0000	126.8921	126.8921	0.0310	0.0000	127.5434
Total	**1.5769**	**14.3675**	**10.4942**	**0.0161**	**19.0059**	**0.8478**	**19.8537**	**2.1756**	**0.7908**	**2.9663**	**0.0000**	**1,428.2093**	**1,428.2093**	**0.3434**	**0.0000**	**1,435.4213**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.4470	5.0254	3.5028	4.2900e-003	2.2464	0.2448	2.4912	0.3405	0.2252	0.5657	0.0000	401.0298	401.0298	0.1109	0.0000	403.3582
2016	0.5153	4.4646	3.0660	5.5300e-003	3.7398	0.2778	4.0175	0.3834	0.2606	0.6439	0.0000	490.8562	490.8562	0.1140	0.0000	493.2494
2017	0.5039	3.8856	2.9806	4.8000e-003	3.7255	0.2549	3.9804	0.3819	0.2403	0.6222	0.0000	409.4299	409.4299	0.0876	0.0000	411.2691
2018	0.1107	0.9919	0.9449	1.4900e-003	1.8771	0.0703	1.9474	0.1924	0.0647	0.2571	0.0000	126.8920	126.8920	0.0310	0.0000	127.5433
Total	**1.5769**	**14.3675**	**10.4942**	**0.0161**	**11.5887**	**0.8478**	**12.4365**	**1.2981**	**0.7908**	**2.0889**	**0.0000**	**1,428.2078**	**1,428.2078**	**0.3434**	**0.0000**	**1,435.4199**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**39.03**	**0.00**	**37.36**	**40.33**	**0.00**	**29.58**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	6/30/2015	7/31/2015	5	24	Phase 1
2	Grading	Grading	8/1/2015	12/31/2015	5	109	Phase 1
3	Well Construction	Building Construction	1/1/2016	12/30/2016	5	261	Phases 2 & 3
4	Wellheads/Pipelines	Trenching	1/1/2017	1/1/2018	5	261	Phases 4 & 5
5	Central Intake Canal Construction	Trenching	1/2/2018	7/2/2018	5	130	Phase 6

Acres of Grading (Site Preparation Phase): 200

Acres of Grading (Grading Phase): 200

Acres of Paving: 0

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	162	0.38
Grading	Graders	1	8.00	174	0.41
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Well Construction	Bore/Drill Rigs	1	8.00	205	0.50
Well Construction	Cranes	1	7.00	226	0.29
Well Construction	Forklifts	3	8.00	89	0.20
Well Construction	Generator Sets	1	8.00	84	0.74
Well Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Well Construction	Welders	1	8.00	46	0.45
Wellheads/Pipelines	Cranes	1	8.00	226	0.29
Wellheads/Pipelines	Generator Sets	1	8.00	84	0.74
Wellheads/Pipelines	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Wellheads/Pipelines	Trenchers	1	8.00	80	0.50
Wellheads/Pipelines	Welders	2	8.00	46	0.45
Central Intake Canal Construction	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Central Intake Canal Construction	Trenchers	1	8.00	80	0.50

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	40.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	40.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Well Construction	10	40.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Wellheads/Pipelines	8	40.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Central Intake Canal Construction	5	40.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3229	0.0000	0.3229	0.1306	0.0000	0.1306	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0631	0.6827	0.5116	4.7000e-004		0.0371	0.0371		0.0341	0.0341	0.0000	44.7613	44.7613	0.0134	0.0000	45.0420
Total	**0.0631**	**0.6827**	**0.5116**	**4.7000e-004**	**0.3229**	**0.0371**	**0.3599**	**0.1306**	**0.0341**	**0.1647**	**0.0000**	**44.7613**	**44.7613**	**0.0134**	**0.0000**	**45.0420**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.2000e-004	2.5700e-003	3.7300e-003	1.0000e-005	0.0108	5.0000e-005	0.0108	1.1000e-003	4.0000e-005	1.1400e-003	0.0000	0.4769	0.4769	0.0000	0.0000	0.4770
Worker	2.3300e-003	3.6800e-003	0.0360	8.0000e-005	0.5472	5.0000e-005	0.5472	0.0556	4.0000e-005	0.0556	0.0000	5.9433	5.9433	3.2000e-004	0.0000	5.9499
Total	**2.6500e-003**	**6.2500e-003**	**0.0398**	**9.0000e-005**	**0.5579**	**1.0000e-004**	**0.5580**	**0.0567**	**8.0000e-005**	**0.0567**	**0.0000**	**6.4202**	**6.4202**	**3.2000e-004**	**0.0000**	**6.4270**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1453	0.0000	0.1453	0.0588	0.0000	0.0588	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0631	0.6827	0.5116	4.7000e-004		0.0371	0.0371		0.0341	0.0341	0.0000	44.7613	44.7613	0.0134	0.0000	45.0419
Total	**0.0631**	**0.6827**	**0.5116**	**4.7000e-004**	**0.1453**	**0.0371**	**0.1823**	**0.0588**	**0.0341**	**0.0929**	**0.0000**	**44.7613**	**44.7613**	**0.0134**	**0.0000**	**45.0419**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.2000e-004	2.5700e-003	3.7300e-003	1.0000e-005	6.6500e-003	5.0000e-005	6.6900e-003	6.9000e-004	4.0000e-005	7.3000e-004	0.0000	0.4769	0.4769	0.0000	0.0000	0.4770
Worker	2.3300e-003	3.6800e-003	0.0360	8.0000e-005	0.3372	5.0000e-005	0.3373	0.0346	4.0000e-005	0.0346	0.0000	5.9433	5.9433	3.2000e-004	0.0000	5.9499
Total	**2.6500e-003**	**6.2500e-003**	**0.0398**	**9.0000e-005**	**0.3439**	**1.0000e-004**	**0.3440**	**0.0353**	**8.0000e-005**	**0.0353**	**0.0000**	**6.4202**	**6.4202**	**3.2000e-004**	**0.0000**	**6.4270**

3.3 Grading - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Fugitive Dust					0.4343	0.0000	0.4343	0.1919	0.0000	0.1919	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3692	4.3080	2.7708	3.3700e-003		0.2072	0.2072		0.1906	0.1906	0.0000	320.6900	320.6900	0.0957	0.0000	322.7006
Total	**0.3692**	**4.3080**	**2.7708**	**3.3700e-003**	**0.4343**	**0.2072**	**0.6415**	**0.1919**	**0.1906**	**0.3825**	**0.0000**	**320.6900**	**320.6900**	**0.0957**	**0.0000**	**322.7006**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.4400e-003	0.0117	0.0170	2.0000e-005	0.0489	2.1000e-004	0.0491	5.0000e-003	1.9000e-004	5.1900e-003	0.0000	2.1661	2.1661	2.0000e-005	0.0000	2.1665
Worker	0.0106	0.0167	0.1637	3.5000e-004	2.4850	2.2000e-004	2.4852	0.2523	2.0000e-004	0.2525	0.0000	26.9925	26.9925	1.4300e-003	0.0000	27.0226
Total	**0.0120**	**0.0284**	**0.1806**	**3.7000e-004**	**2.5339**	**4.3000e-004**	**2.5343**	**0.2573**	**3.9000e-004**	**0.2577**	**0.0000**	**29.1586**	**29.1586**	**1.4500e-003**	**0.0000**	**29.1891**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1954	0.0000	0.1954	0.0863	0.0000	0.0863	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3692	4.3080	2.7708	3.3700e-003		0.2072	0.2072		0.1906	0.1906	0.0000	320.6897	320.6897	0.0957	0.0000	322.7002

Total	**0.3692**	**4.3080**	**2.7708**	**3.3700e-003**	**0.1954**	**0.2072**	**0.4026**	**0.0863**	**0.1906**	**0.2770**	**0.0000**	**320.6897**	**320.6897**	**0.0957**	**0.0000**	**322.7002**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.4400e-003	0.0117	0.0170	2.0000e-005	0.0302	2.1000e-004	0.0304	3.1300e-003	1.9000e-004	3.3200e-003	0.0000	2.1661	2.1661	2.0000e-005	0.0000	2.1665
Worker	0.0106	0.0167	0.1637	3.5000e-004	1.5316	2.2000e-004	1.5319	0.1570	2.0000e-004	0.1572	0.0000	26.9925	26.9925	1.4300e-003	0.0000	27.0226
Total	**0.0120**	**0.0284**	**0.1806**	**3.7000e-004**	**1.5618**	**4.3000e-004**	**1.5623**	**0.1601**	**3.9000e-004**	**0.1605**	**0.0000**	**29.1586**	**29.1586**	**1.4500e-003**	**0.0000**	**29.1891**

3.4 Well Construction - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4899	4.4047	2.6824	4.6400e-003		0.2768	0.2768		0.2597	0.2597	0.0000	423.4759	423.4759	0.1108	0.0000	425.8025
Total	**0.4899**	**4.4047**	**2.6824**	**4.6400e-003**		**0.2768**	**0.2768**		**0.2597**	**0.2597**	**0.0000**	**423.4759**	**423.4759**	**0.1108**	**0.0000**	**425.8025**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0600e-003	0.0243	0.0376	6.0000e-005	0.1172	4.2000e-004	0.1176	0.0120	3.9000e-004	0.0124	0.0000	5.1249	5.1249	4.0000e-005	0.0000	5.1259
Worker	0.0223	0.0356	0.3459	8.3000e-004	5.9503	4.9000e-004	5.9508	0.6042	4.5000e-004	0.6046	0.0000	62.2559	62.2559	3.1200e-003	0.0000	62.3215
Total	**0.0253**	**0.0599**	**0.3835**	**8.9000e-004**	**6.0674**	**9.1000e-004**	**6.0683**	**0.6161**	**8.4000e-004**	**0.6170**	**0.0000**	**67.3808**	**67.3808**	**3.1600e-003**	**0.0000**	**67.4474**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4899	4.4047	2.6824	4.6400e-003		0.2768	0.2768		0.2597	0.2597	0.0000	423.4754	423.4754	0.1108	0.0000	425.8020
Total	**0.4899**	**4.4047**	**2.6824**	**4.6400e-003**		**0.2768**	**0.2768**		**0.2597**	**0.2597**	**0.0000**	**423.4754**	**423.4754**	**0.1108**	**0.0000**	**425.8020**

Mitigated Construction Off-Site

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

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0600e-003	0.0243	0.0376	6.0000e-005	0.0723	4.2000e-004	0.0727	7.4900e-003	3.9000e-004	7.8700e-003	0.0000	5.1249	5.1249	4.0000e-005	0.0000	5.1259
Worker	0.0223	0.0356	0.3459	8.3000e-004	3.6675	4.9000e-004	3.6680	0.3759	4.5000e-004	0.3763	0.0000	62.2559	62.2559	3.1200e-003	0.0000	62.3215
Total	**0.0253**	**0.0599**	**0.3835**	**8.9000e-004**	**3.7398**	**9.1000e-004**	**3.7407**	**0.3834**	**8.4000e-004**	**0.3842**	**0.0000**	**67.3808**	**67.3808**	**3.1600e-003**	**0.0000**	**67.4474**

3.5 Wellheads/Pipelines - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4820	3.8327	2.6437	3.9200e-003		0.2541	0.2541		0.2396	0.2396	0.0000	344.8588	344.8588	0.0847	0.0000	346.6374
Total	**0.4820**	**3.8327**	**2.6437**	**3.9200e-003**		**0.2541**	**0.2541**		**0.2396**	**0.2396**	**0.0000**	**344.8588**	**344.8588**	**0.0847**	**0.0000**	**346.6374**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7000e-003	0.0214	0.0348	6.0000e-005	0.1167	3.5000e-004	0.1171	0.0119	3.2000e-004	0.0123	0.0000	5.0185	5.0185	4.0000e-005	0.0000	5.0194
Worker	0.0192	0.0315	0.3021	8.3000e-004	5.9275	4.7000e-004	5.9280	0.6018	4.3000e-004	0.6023	0.0000	59.5530	59.5530	2.8400e-003	0.0000	59.6127
Total	**0.0219**	**0.0529**	**0.3369**	**8.9000e-004**	**6.0442**	**8.2000e-004**	**6.0450**	**0.6138**	**7.5000e-004**	**0.6145**	**0.0000**	**64.5715**	**64.5715**	**2.8800e-003**	**0.0000**	**64.6321**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4820	3.8327	2.6437	3.9200e-003		0.2541	0.2541		0.2396	0.2396	0.0000	344.8584	344.8584	0.0847	0.0000	346.6370
Total	**0.4820**	**3.8327**	**2.6437**	**3.9200e-003**		**0.2541**	**0.2541**		**0.2396**	**0.2396**	**0.0000**	**344.8584**	**344.8584**	**0.0847**	**0.0000**	**346.6370**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7000e-003	0.0214	0.0348	6.0000e-005	0.0720	3.5000e-004	0.0724	7.4600e-003	3.2000e-004	7.7800e-003	0.0000	5.0185	5.0185	4.0000e-005	0.0000	5.0194
Worker	0.0192	0.0315	0.3021	8.3000e-004	3.6534	4.7000e-004	3.6539	0.3744	4.3000e-004	0.3749	0.0000	59.5530	59.5530	2.8400e-003	0.0000	59.6127
Total	**0.0219**	**0.0529**	**0.3369**	**8.9000e-004**	**3.7255**	**8.2000e-004**	**3.7263**	**0.3819**	**7.5000e-004**	**0.3826**	**0.0000**	**64.5715**	**64.5715**	**2.8800e-003**	**0.0000**	**64.6321**

3.5 Wellheads/Pipelines - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.6000e-003	0.0131	9.8300e-003	2.0000e-005		8.3000e-004	8.3000e-004		7.8000e-004	7.8000e-004	0.0000	1.3121	1.3121	3.2000e-004	0.0000	1.3188
Total	**1.6000e-003**	**0.0131**	**9.8300e-003**	**2.0000e-005**		**8.3000e-004**	**8.3000e-004**		**7.8000e-004**	**7.8000e-004**	**0.0000**	**1.3121**	**1.3121**	**3.2000e-004**	**0.0000**	**1.3188**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-005	7.0000e-005	1.3000e-004	0.0000	4.5000e-004	0.0000	4.5000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.0190	0.0190	0.0000	0.0000	0.0190
Worker	6.0000e-005	1.1000e-004	1.0200e-003	0.0000	0.0228	0.0000	0.0228	2.3100e-003	0.0000	2.3200e-003	0.0000	0.2197	0.2197	1.0000e-005	0.0000	0.2199
Total	**7.0000e-005**	**1.8000e-004**	**1.1500e-003**	**0.0000**	**0.0233**	**0.0000**	**0.0233**	**2.3600e-003**	**0.0000**	**2.3700e-003**	**0.0000**	**0.2387**	**0.2387**	**1.0000e-005**	**0.0000**	**0.2389**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.6000e-003	0.0131	9.8300e-003	2.0000e-005		8.3000e-004	8.3000e-004		7.8000e-004	7.8000e-004	0.0000	1.3121	1.3121	3.2000e-004	0.0000	1.3188

Total	**1.6000e-003**	**0.0131**	**9.8300e-003**	**2.0000e-005**		**8.3000e-004**	**8.3000e-004**		**7.8000e-004**	**7.8000e-004**	**0.0000**	**1.3121**	**1.3121**	**3.2000e-004**	**0.0000**	**1.3188**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-005	7.0000e-005	1.3000e-004	0.0000	2.8000e-004	0.0000	2.8000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0190	0.0190	0.0000	0.0000	0.0190
Worker	6.0000e-005	1.1000e-004	1.0200e-003	0.0000	0.0141	0.0000	0.0141	1.4400e-003	0.0000	1.4400e-003	0.0000	0.2197	0.2197	1.0000e-005	0.0000	0.2199
Total	**7.0000e-005**	**1.8000e-004**	**1.1500e-003**	**0.0000**	**0.0143**	**0.0000**	**0.0143**	**1.4700e-003**	**0.0000**	**1.4700e-003**	**0.0000**	**0.2387**	**0.2387**	**1.0000e-005**	**0.0000**	**0.2389**

3.6 Central Intake Canal Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0994	0.9550	0.7843	1.0300e-003		0.0691	0.0691		0.0636	0.0636	0.0000	94.3124	94.3124	0.0294	0.0000	94.9290
Total	**0.0994**	**0.9550**	**0.7843**	**1.0300e-003**		**0.0691**	**0.0691**		**0.0636**	**0.0636**	**0.0000**	**94.3124**	**94.3124**	**0.0294**	**0.0000**	**94.9290**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.2400e-003	9.6200e-003	0.0165	3.0000e-005	0.0584	1.6000e-004	0.0585	5.9600e-003	1.5000e-004	6.1100e-003	0.0000	2.4655	2.4655	2.0000e-005	0.0000	2.4659
Worker	8.3700e-003	0.0141	0.1332	4.1000e-004	2.9637	2.3000e-004	2.9640	0.3009	2.1000e-004	0.3011	0.0000	28.5634	28.5634	1.3000e-003	0.0000	28.5908
Total	**9.6100e-003**	**0.0237**	**0.1497**	**4.4000e-004**	**3.0221**	**3.9000e-004**	**3.0225**	**0.3069**	**3.6000e-004**	**0.3072**	**0.0000**	**31.0289**	**31.0289**	**1.3200e-003**	**0.0000**	**31.0567**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0994	0.9550	0.7843	1.0300e-003		0.0691	0.0691		0.0636	0.0636	0.0000	94.3123	94.3123	0.0294	0.0000	94.9289
Total	**0.0994**	**0.9550**	**0.7843**	**1.0300e-003**		**0.0691**	**0.0691**		**0.0636**	**0.0636**	**0.0000**	**94.3123**	**94.3123**	**0.0294**	**0.0000**	**94.9289**

Mitigated Construction Off-Site

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

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.2400e-003	9.6200e-003	0.0165	3.0000e-005	0.0360	1.6000e-004	0.0362	3.7300e-003	1.5000e-004	3.8800e-003	0.0000	2.4655	2.4655	2.0000e-005	0.0000	2.4659
Worker	8.3700e-003	0.0141	0.1332	4.1000e-004	1.8267	2.3000e-004	1.8270	0.1872	2.1000e-004	0.1874	0.0000	28.5634	28.5634	1.3000e-003	0.0000	28.5908
Total	**9.6100e-003**	**0.0237**	**0.1497**	**4.4000e-004**	**1.8627**	**3.9000e-004**	**1.8631**	**0.1909**	**3.6000e-004**	**0.1913**	**0.0000**	**31.0289**	**31.0289**	**1.3200e-003**	**0.0000**	**31.0567**

IRWD Stockdale West Joint Banking - Operations

Kern-San Joaquin County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	200.00	Acre	200.00	8,712,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	32
Climate Zone	3			**Operational Year**	2018
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Parking land use input as representative of the basins.

Construction Phase - Schedule assumes that 2 rounds of grading basins would occur within a one year period, at Stockdale East and either Stockdale West or the 3rd unknown site, for instance.

Off-road Equipment - Mix of tractors/loaders/backhoes (4) and trencher (1) assumed for Central Intake Canal construction

Trips and VMT - Assumes average of 4 workers and 1 delivery truck per day

On-road Fugitive Dust - Assumed 95 % of on-road vehicle travel would be on paved roads

Grading - 200 acres total disturbed per site, no soil import/export assumed

Construction Off-road Equipment Mitigation - Mitigations applied: water 2x/day, limit vehicle speed to 15 mph on unpaved roads

Off-road Equipment - Equipment list provided in Project Description -- grader (1), loader (1), tractor (1)

Off-road Equipment - Equipment list provided in Project Description -- grader (1), loader (1), tractor (1)

Energy Use - Total electrical use of project operations (Stockdale East and West) = 9,633,000 kwh/yr (worse-case, per Project Description), or 1.106 kWhr/sf/yr

Area Coating - No architectural coatings anticipated

Consumer Products - Consumer products not applicable to project

Landscape Equipment - Natural grazing rather than landscape equipment

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	4356000	0
tblAreaCoating	Area_Nonresidential_Interior	13068000	0
tblConstructionPhase	NumDays	310.00	23.00
tblConstructionPhase	NumDays	310.00	23.00
tblConstructionPhase	PhaseEndDate	3/5/2018	7/3/2018
tblConstructionPhase	PhaseStartDate	2/1/2018	6/1/2018
tblEnergyUse	T24E	0.00	1.11
tblGrading	AcresOfGrading	57.50	200.00
tblGrading	AcresOfGrading	57.50	200.00
tblOnRoadDust	HaulingPercentPave	100.00	95.00
tblOnRoadDust	HaulingPercentPave	100.00	95.00
tblOnRoadDust	VendorPercentPave	100.00	95.00
tblOnRoadDust	VendorPercentPave	100.00	95.00
tblOnRoadDust	WorkerPercentPave	100.00	95.00
tblOnRoadDust	WorkerPercentPave	100.00	95.00
tblProjectCharacteristics	OperationalYear	2014	2018
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripNumber	20.00	8.00
tblTripsAndVMT	WorkerTripNumber	20.00	8.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.0324	0.3165	0.2301	3.2000e-004	0.5810	0.0194	0.6004	0.1224	0.0178	0.1403	0.0000	29.0038	29.0038	8.2300e-003	0.0000	29.1766
Total	**0.0324**	**0.3165**	**0.2301**	**3.2000e-004**	**0.5810**	**0.0194**	**0.6004**	**0.1224**	**0.0178**	**0.1403**	**0.0000**	**29.0038**	**29.0038**	**8.2300e-003**	**0.0000**	**29.1766**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.0324	0.3165	0.2301	3.2000e-004	0.2998	0.0194	0.3192	0.0591	0.0178	0.0770	0.0000	29.0038	29.0038	8.2300e-003	0.0000	29.1766
Total	**0.0324**	**0.3165**	**0.2301**	**3.2000e-004**	**0.2998**	**0.0194**	**0.3192**	**0.0591**	**0.0178**	**0.0770**	**0.0000**	**29.0038**	**29.0038**	**8.2300e-003**	**0.0000**	**29.1766**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**48.40**	**0.00**	**46.84**	**51.70**	**0.00**	**45.13**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2,803.0693	2,803.0693	0.1268	0.0262	2,813.8602
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2,803.0693**	**2,803.0693**	**0.1268**	**0.0262**	**2,813.8602**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2,803.0693	2,803.0693	0.1268	0.0262	2,813.8602
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2,803.0693**	**2,803.0693**	**0.1268**	**0.0262**	**2,813.8602**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Stockdale East	Grading	1/1/2018	1/31/2018	5	23	
2	Additional Site	Grading	6/1/2018	7/3/2018	5	23	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Additional Site	Graders	1	8.00	174	0.41
Stockdale East	Graders	1	8.00	174	0.41
Stockdale East	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Additional Site	Tractors/Loaders/Backhoes	2	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Additional Site	8	8.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stockdale East	8	8.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Stockdale East - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1753	0.0000	0.1753	0.0495	0.0000	0.0495	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0157	0.1561	0.1074	1.4000e-004		9.6600e-003	9.6600e-003		8.8800e-003	8.8800e-003	0.0000	13.0550	13.0550	4.0600e-003	0.0000	13.1403
Total	**0.0157**	**0.1561**	**0.1074**	**1.4000e-004**	**0.1753**	**9.6600e-003**	**0.1850**	**0.0495**	**8.8800e-003**	**0.0584**	**0.0000**	**13.0550**	**13.0550**	**4.0600e-003**	**0.0000**	**13.1403**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.2000e-004	1.7000e-003	2.9100e-003	0.0000	0.0103	3.0000e-005	0.0104	1.0500e-003	3.0000e-005	1.0800e-003	0.0000	0.4362	0.4362	0.0000	0.0000	0.4363
Worker	3.0000e-004	5.0000e-004	4.7100e-003	1.0000e-005	0.1049	1.0000e-005	0.1049	0.0107	1.0000e-005	0.0107	0.0000	1.0107	1.0107	5.0000e-005	0.0000	1.0117
Total	**5.2000e-004**	**2.2000e-003**	**7.6200e-003**	**1.0000e-005**	**0.1152**	**4.0000e-005**	**0.1152**	**0.0117**	**4.0000e-005**	**0.0117**	**0.0000**	**1.4469**	**1.4469**	**5.0000e-005**	**0.0000**	**1.4480**

3.2 Stockdale East - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0789	0.0000	0.0789	0.0223	0.0000	0.0223	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0157	0.1561	0.1074	1.4000e-004		9.6600e-003	9.6600e-003		8.8800e-003	8.8800e-003	0.0000	13.0550	13.0550	4.0600e-003	0.0000	13.1403
Total	**0.0157**	**0.1561**	**0.1074**	**1.4000e-004**	**0.0789**	**9.6600e-003**	**0.0886**	**0.0223**	**8.8800e-003**	**0.0312**	**0.0000**	**13.0550**	**13.0550**	**4.0600e-003**	**0.0000**	**13.1403**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.2000e-004	1.7000e-003	2.9100e-003	0.0000	6.3700e-003	3.0000e-005	6.4000e-003	6.6000e-004	3.0000e-005	6.9000e-004	0.0000	0.4362	0.4362	0.0000	0.0000	0.4363
Worker	3.0000e-004	5.0000e-004	4.7100e-003	1.0000e-005	0.0646	1.0000e-005	0.0647	6.6200e-003	1.0000e-005	6.6300e-003	0.0000	1.0107	1.0107	5.0000e-005	0.0000	1.0117
Total	**5.2000e-004**	**2.2000e-003**	**7.6200e-003**	**1.0000e-005**	**0.0710**	**4.0000e-005**	**0.0711**	**7.2800e-003**	**4.0000e-005**	**7.3200e-003**	**0.0000**	**1.4469**	**1.4469**	**5.0000e-005**	**0.0000**	**1.4480**

3.3 Additional Site - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1753	0.0000	0.1753	0.0495	0.0000	0.0495	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0157	0.1561	0.1074	1.4000e-004		9.6600e-003	9.6600e-003		8.8800e-003	8.8800e-003	0.0000	13.0550	13.0550	4.0600e-003	0.0000	13.1403
Total	**0.0157**	**0.1561**	**0.1074**	**1.4000e-004**	**0.1753**	**9.6600e-003**	**0.1850**	**0.0495**	**8.8800e-003**	**0.0584**	**0.0000**	**13.0550**	**13.0550**	**4.0600e-003**	**0.0000**	**13.1403**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.2000e-004	1.7000e-003	2.9100e-003	0.0000	0.0103	3.0000e-005	0.0104	1.0500e-003	3.0000e-005	1.0800e-003	0.0000	0.4362	0.4362	0.0000	0.0000	0.4363
Worker	3.0000e-004	5.0000e-004	4.7100e-003	1.0000e-005	0.1049	1.0000e-005	0.1049	0.0107	1.0000e-005	0.0107	0.0000	1.0107	1.0107	5.0000e-005	0.0000	1.0117
Total	**5.2000e-004**	**2.2000e-003**	**7.6200e-003**	**1.0000e-005**	**0.1152**	**4.0000e-005**	**0.1152**	**0.0117**	**4.0000e-005**	**0.0117**	**0.0000**	**1.4469**	**1.4469**	**5.0000e-005**	**0.0000**	**1.4480**

3.3 Additional Site - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0789	0.0000	0.0789	0.0223	0.0000	0.0223	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0157	0.1561	0.1074	1.4000e-004		9.6600e-003	9.6600e-003		8.8800e-003	8.8800e-003	0.0000	13.0550	13.0550	4.0600e-003	0.0000	13.1403
Total	**0.0157**	**0.1561**	**0.1074**	**1.4000e-004**	**0.0789**	**9.6600e-003**	**0.0886**	**0.0223**	**8.8800e-003**	**0.0312**	**0.0000**	**13.0550**	**13.0550**	**4.0600e-003**	**0.0000**	**13.1403**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.2000e-004	1.7000e-003	2.9100e-003	0.0000	6.3700e-003	3.0000e-005	6.4000e-003	6.6000e-004	3.0000e-005	6.9000e-004	0.0000	0.4362	0.4362	0.0000	0.0000	0.4363
Worker	3.0000e-004	5.0000e-004	4.7100e-003	1.0000e-005	0.0646	1.0000e-005	0.0647	6.6200e-003	1.0000e-005	6.6300e-003	0.0000	1.0107	1.0107	5.0000e-005	0.0000	1.0117
Total	**5.2000e-004**	**2.2000e-003**	**7.6200e-003**	**1.0000e-005**	**0.0710**	**4.0000e-005**	**0.0711**	**7.2800e-003**	**4.0000e-005**	**7.3200e-003**	**0.0000**	**1.4469**	**1.4469**	**5.0000e-005**	**0.0000**	**1.4480**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

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

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.351816	0.055390	0.136889	0.180566	0.057178	0.010448	0.023026	0.171783	0.001516	0.001821	0.005963	0.001093	0.002510

4.4 Fleet Mix

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	2,803.0693	2,803.0693	0.1268	0.0262	2,813.8602
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	2,803.0693	2,803.0693	0.1268	0.0262	2,813.8602
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

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

5.2 Energy by Land Use - NaturalGas

Mitigated

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

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	9.63547e+006	2,803.0693	0.1268	0.0262	2,813.8602
Total		**2,803.0693**	**0.1268**	**0.0262**	**2,813.8602**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	9.63547e+006	2,803.0693	0.1268	0.0262	2,813.8602
Total		**2,803.0693**	**0.1268**	**0.0262**	**2,813.8602**

6.0 Area Detail

6.1 Mitigation Measures Area

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

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**					**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**					**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

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

7.2 Water by Land Use

Unmitigated

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

7.2 Water by Land Use

Mitigated

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

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

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

8.2 Waste by Land Use

Unmitigated

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

Mitigated

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

9.0 Operational Offroad

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

10.0 Vegetation

IRWD Stockdale Integrated Banking Project
CalEEMod Raw Information

Construction Emissions:

	CO_2	CH_4	CH_4 (CO_2e)	N_2O	N_2O (CO_2e)	CO_2e
			MT/year			
2015	401.03	0.1109	2.7725	0	0	403.80
2016	490.86	0.114	2.85	0	0	493.71
2017	409.43	0.0876	2.19	0	0	411.62
2018	126.89	0.031	0.775	0	0	127.67
						1,436.80

Amortized (over 30 years): 47.89322667

Operational Emissions:

		CO_2	CH_4	CH_4 (CO_2e)	N_2O	N_2O (CO_2e)	CO_2e
				MT/year			
Off-Road	Stockdale East	13.06	0.00406	0.1015	0	0	13.16
	Additional Site	13.06	0.00406	0.1015	0	0	13.16
On-Road	Stockdale East	1.45	0.00005	0.00125	0	0	1.45
	Additional Site	1.45	0.00005	0.00125	0	0	1.45
							29.21

Off-road Equipment - Operational Maintenance 26.31
On-road Motor Vehicle Trips - Operational Maintenance 2.90

EMISSIONS OF GREENHOUSE GAS EMISSIONS FROM ELECTRICITY CONSUMPTION

Project Name: IRWD Stockdale West Joint Banking
Analysis Year: 2018
Analysis Scenario: Project Operations

ELECTRICITY DEMAND

Total Megawatt Hours (MWh) per Year: 10,312.5

GREENHOUSE GAS EMISSIONS

Emissions	Emission Factors (lbs/MWh)	Emissions (metric tons)	CO_2 Equivalency Factors	CO_2 Equivalent Emissions (tons per year)
Carbon Dioxide	641.35	3,000.03	1	3,000.03
Methane	0.029	0.136	25	3.39
Nitrous Oxide	0.006	0.028	298	8.36
	Total Emissions:	3,000.19		3,011.78

Source of Emission Factors: CalEEMod.2013.2.2 - emission factors for Pacific Gas & Electric Company
Source of CO2e factors: CARB. 2014. First Update to the Climate Change Scoping Plan. May.

Appendix D-1

Biological Technical Report

STOCKDALE INTEGRATED BANKING PROJECT

Biological Technical Report

Prepared for
Irvine Ranch Water District and
Rosedale-Rio Bravo Water Storage District

September 2013

STOCKDALE INTEGRATED BANKING PROJECT

Biological Technical Report

Prepared for
Irvine Ranch Water District and
Rosedale-Rio Bravo Water Storage District

September 2013

626 Wilshire Boulevard
Suite 1100
Los Angeles, CA 90017
213.599.4300
www.esassoc.com

Oakland

Orlando

Palm Springs

Petaluma

Portland

Sacramento

San Diego

San Francisco

Santa Cruz

Seattle

Tampa

Woodland Hills

D211181

OUR COMMITMENT TO SUSTAINABILITY | ESA helps a variety of public and private sector clients plan and prepare for climate change and emerging regulations that limit GHG emissions. ESA is a registered assessor with the California Climate Action Registry, a Climate Leader, and founding reporter for the Climate Registry. ESA is also a corporate member of the U.S. Green Building Council and the Business Council on Climate Change (BC3). Internally, ESA has adopted a Sustainability Vision and Policy Statement and a plan to reduce waste and energy within our operations. This document was produced using recycled paper.

TABLE OF CONTENTS

Biological Technical Report: Stockdale Integrated Banking Project, Kern County, California

Page

Executive Summary 1

1. Introduction 1
   - 1.1 Project Location 1
   - 1.2 Project Description 1

2. Methods 6
   - 2.1 Biological Resource Reconnaissance 6
   - 2.2 Special-Status Species Habitat Assessment 7
   - 2.3 Jurisdictional Waters and Wetlands Investigation 7

3. Natural Resource Setting 7
   - 3.1 Climate 8
   - 3.2 Soils and Topography 8
   - 3.3 Vegetation Communities and Habitat 9
   - 3.5 Special-Status Species and Natural Communities 17
   - 3.6 Connectivity and Wildlife Movement Corridors 30

4. Regulatory Framework 30
   - 4.1 Federal 30
   - 4.2 State 32
   - 4.3 Local 35

5. Survey Results 37
   - 5.1 Sensitive Wildlife Species 37
   - 5.2 Special-Status Plant Species 41
   - 5.3 Jurisdictional Resources 41

6. Project Impacts and Mitigation Measures 42
   - Significance Criteria 42
   - 6.1 Special-Status Species and Their Habitats 43
   - 6.2 Riparian Habitats and Natural Communities 51
   - 6.3 Protected Wetlands and Jurisdictional Resources 51
   - 6.4 Habitat Linkages and Wildlife Movement Corridors 52
   - 6.5 Local Policies and Ordinances 52
   - 6.6 Habitat Conservation Plans 52

7. Contributing Biologists 52

8. References 52

Figures

Figure 1 Regional Map....3
Figure 2 Proposed Project Facilities....5
Figure 3 Vegetation Communities....11
Figure 4 CNDDB Records within 3 miles of Project Site....19
Figure 5 Impacts to Vegetation Communities....45

Tables

Table 1 Special-Status Wildlife Species With Potential to Occur in Project Area....20
Table 2 Rare Plants with Potential to Occur in Project Area....26

EXECUTIVE SUMMARY

IRWD Stockdale Integrated Banking Project Biological Technical Report

A biological resource reconnaissance was conducted for the Stockdale Integrated Banking Project (proposed project) to gather baseline biological resources data prior to development. The proposed project would convert agricultural lands into water recharge basins. A background investigation of the proposed project site was conducted that included a literature search, queries of the California Natural Diversity Database, and California Native Plant Society Inventory of Rare and Endangered Plants. Results of the reconnaissance, in combination with the findings of the background investigation, were used to assess the potential for the proposed project site to support special-status plant and animal species, and natural communities; and to investigate the potential for jurisdictional resources to occur on the proposed project site. Also provided is an analysis of the potential impacts to these biological resources that may result from implementing the proposed project.

The proposed project site is mostly developed and currently supports three vegetation communities: Developed Agriculture, Developed Water Recharge Basin Land Cover, and non-native grassland. Because the site is largely developed and lacks native plant communities no special-status plant species are anticipated to occur there, and no special-status natural communities were identified during the reconnaissance. Therefore, no impacts to special-status plants or natural communities are expected to occur from implementing the proposed project. However, the vegetation communities on the proposed project site support a diversity of common, rare, and special-status wildlife species that may be impacted during construction. Impacts to special-status species or their habitat would be considered significant under CEQA and will require mitigation to reduce the effects to a less than significant level.

Special-status wildlife species that have the potential to be impacted by the proposed project include burrowing owl, Swainson's hawk, tricolored blackbird, and San Joaquin kit fox. A biologist observed three individual burrowing owls occupying non-native grassland on the proposed project site. The remaining special-status wildlife species listed above have not been observed on the proposed project site but were assessed as having a medium or high potential to occur there. The tricolored blackbird and American badger have been observed by biologists in the immediate vicinity of the proposed project site during previous surveys conducted for unrelated projects.

The proposed project is not expected to result in a substantial loss of habitat that would affect the ability of species to disperse throughout the proposed project site and surrounding habitats. After construction is complete, much of the Developed Agriculture found on the proposed project site

will continue to support agriculture for eight months of the year. No mitigation for these impacts is necessary because the Metropolitan Bakersfield Habitat Conservation Plan, which assists urban development applicants in complying with State and federal endangered species laws, provides a mitigation fee exemption to impacts to wildlife habitat that occurs from development of "commercial agriculture".

No Waters of the U.S., Waters of the State, or any other additional jurisdictional riparian habitat occurs within the proposed project site, and no impacts are anticipated to occur to canals identified during surveys of the Developed Recharge Basin vegetation community. No mitigation is required.

Several mitigation measures are recommended in Section 6 of this report that would reduce potential impacts to biological resources to a level that is less than significant.

IRWD STOCKDALE INTEGRATED BANKING PROJECT

Biological Technical Report

1. Introduction

This Biological Technical Report (BTR) describes effects to biological resources that would result from implementation of the Stockdale Integrated Banking Project (proposed project). The following discussion addresses existing environmental conditions in the affected area, identifies and analyzes environmental impacts for the proposed project, and recommends measures to avoid, minimize or mitigate significant impacts anticipated from construction and operation of the proposed project. Impacts are assessed relative to existing laws and regulations relevant to biological resources, as described. In some cases, compliance with these existing laws and regulations would serve to reduce or avoid certain impacts that might otherwise occur with implementation of the proposed project.

1.1 Project Location

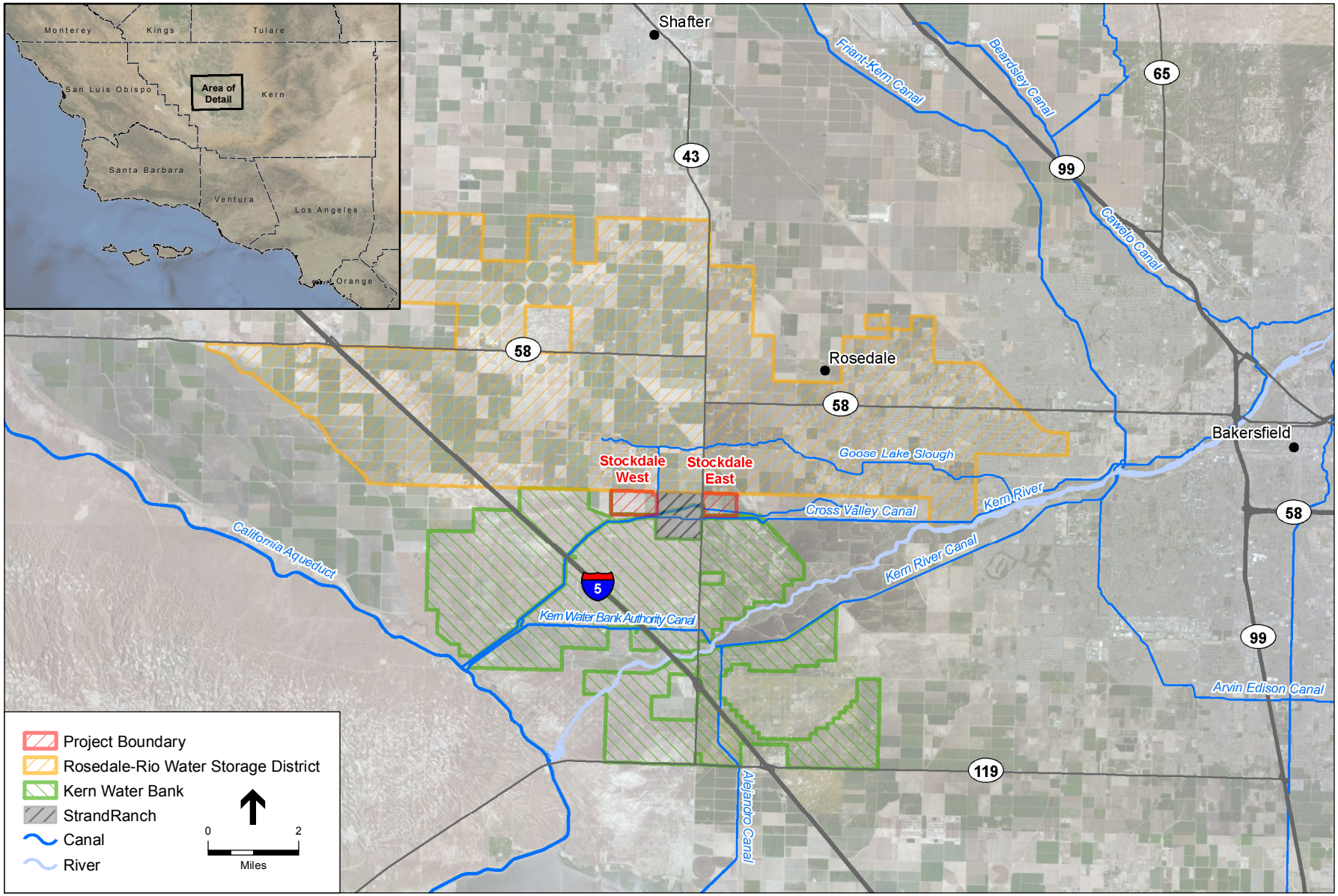
The proposed project is located in western Kern County, approximately six miles west of the City of Bakersfield, 10 miles southwest of the Friant-Kern Canal, 2.50 miles south of the City of Shafter, and six miles east of the California Aqueduct (see **Figure 1**). The project sites consist of Stockdale East, Stockdale West, and a third property that may be acquired by either agency within a site radius shown in Figure 1. This BTR focuses specifically on Stockdale East and Stockdale West, collectively referred to as the "project site." Stockdale East consists of approximately 230 acres of agricultural land and is located adjacent to and north of the Cross Valley Canal (CVC). Currently the crops grown on Stockdale East are cotton and alfalfa. There is a small pilot groundwater banking facility on Stockdale East as well. Stockdale West consists of approximately 323 acres of land and is located north of the Pioneer Canal and the CVC. Existing conditions at Stockdale West include four recharge basins that cover 265 acres, built as part of a one-year Pilot Recharge Project.

1.2 Project Description

The proposed project would integrate the Stockdale East and Stockdale West properties depicted in **Figure 1** into Rosedale-Rio Bravo Water Storage District's (Rosedale) existing Conjunctive Use Program. Rosedale's Conjunctive Use Program is a groundwater recharge, storage, and recovery program for land owners and other water districts. The Stockdale East property is owned by Rosedale and the Stockdale West property is owned by Irvine Ranch Water District (IRWD). Both properties are located immediately adjacent to IRWD's Strand Ranch Integrated Banking Project, which also is part of Rosedale's Conjunctive Use Program. Although the proposed

project is located adjacent to the Strand Ranch, the proposed project would be considered a new and separate project. The project will be designed to avoid suitable habitat for special-status species, if feasible.

The proposed project would result in the construction and operation of groundwater recharge and recovery facilities. The proposed project would provide for the coordinated use and operation of facilities at both Stockdale sites. Rosedale would operate and maintain all project facilities at both Stockdale West and Stockdale East in a manner similar to existing facilities within the Conjunctive Use Program.



SOURCE: Bing Maps; ESA, 2012.

Stockdale Integrated Banking Project . 211181

Figure 1

Regional Map

Stockdale West

In 2011, IRWD constructed four recharge basins and one overspill containment basin on the Stockdale West property as part of the one-year Pilot Recharge Project. The Pilot Recharge Project facilities include basins and earthen berms consisting of varying shape, size and depth covering 265 acres (or 82 percent) of the property. The existing basin layout avoids the edges of the Pioneer Canal and the CVC as shown in **Figure 2**. The proposed project would utilize the existing recharge basins on Stockdale West. No other recharge basins would be constructed on Stockdale West. However, embankments may be constructed to divide the existing basins into smaller impoundments as may be necessary in the future.

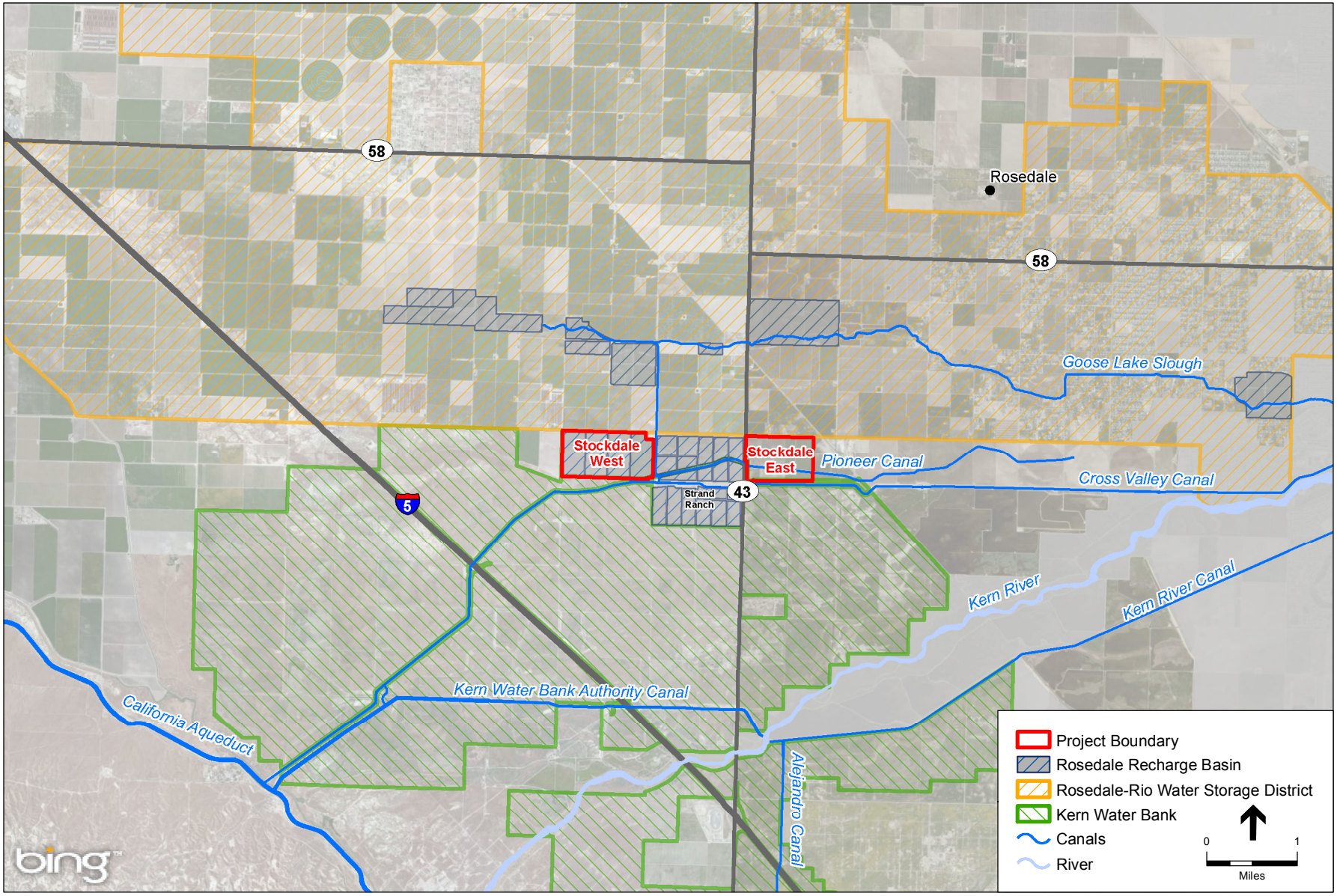
Stockdale East

Stockdale East currently has small pilot groundwater banking facilities onsite. The proposed project would construct new recharge and conveyance facilities on the Stockdale East property, including basins and berms that would occupy approximately 200 acres (or 87 percent) of the property. Recharge facilities would consist of up to eight recharge basins of varying shape, size, and depth. The basins would be constructed to avoid the CVC. The basins would be set back 55 feet from section lines around Stockdale East as required by Kern County. Basins would be formed by excavating and contouring existing soils and using excavated soils to form earthen berm walls. Basin depths would average four to five feet, and basin berms would extend up to six feet above ground level. The basins and berms would be reseeded to blend the berms into the surrounding landscape and to allow agricultural land uses to continue, such as farming or grazing. Dirt roads would run along the perimeter of and in between all basins to provide access to facilities during operation and maintenance activities.

The Stockdale East property currently is actively cultivated for agricultural purposes but also contains an active oilfield (Ram Environmental, 2009). Stockdale East currently has three operating oil wells with pumping units, one tank farm, one produced water injection well, three idle, and two plugged wellheads onsite. The oilfields would remain active during project implementation and operation. As such, the basins also would avoid developing the drill islands to maintain access to underlying mineral rights.

Recovery Facilities

The proposed recovery facilities at Stockdale East and Stockdale West would be designed to minimize impacts to wells pumping on adjacent properties. Recovery capacity and the number of wells to be constructed will be determined based on modeling of specific subsurface conditions at each site. Wells would be constructed using a standard drill rig. Well components would be installed and the immediate area graded for construction of the concrete pad. The aboveground wellheads and pump houses would be installed and connected to nearby electric junction boxes. The recovery wells would be connected to a conveyance system of underground pipelines to deliver pumped groundwater to the CVC or Rosedale's Intake Channel. Installation of the recovery well conveyance system would require trenching to a depth of about seven feet below existing ground surface. Construction staging would be located on-site within the boundaries of Stockdale West and Stockdale East.



SOURCE: Bing Maps; Kern County GIS, 2012.

Stockdale Integrated Banking Project . 211181

Figure 2

Proposed Project Facilities

2. Methods

The information and analysis presented in this report have been derived from the following sources:

- *Final Environmental Impact Report for the Strand Ranch Integrated Banking Project* (ESA 2008)
- *Metropolitan Bakersfield Habitat Conservation Plan* (City of Bakersfield and Kern County 2002)
- California Department of Fish and Game California Natural Diversity Data Base (CNDDB) (CDFG[1] 2012a)
- State and federally listed endangered and threatened animals of California (CDFG 2011)
- Inventory of Rare and Endangered Vascular Plants of California (online edition, v7-09a). (CNPS 2012)
- Review of relevant literature on biological resources on and around the project site
- Review of maps and aerial photographs of the project and the project vicinity.
- United States Fish and Wildlife Service Critical Habitat Mapper online (USFWS 2012a)
- United States Fish and Wildlife Service National Wetlands Inventory online wetlands mapper (USFWS 2012b)
- United States Fish and Wildlife Service Species Reports (Environmental Conservation Online System)
- United States Department of Agriculture Soil Survey Geographic Data Base online (USDA 2012)

In addition, a reconnaissance level survey was conducted at Stockdale East and Stockdale West, as described below, to identify vegetation and wildlife, and to delineate potential wetlands and waters of the United States (U.S.) that occur or potentially occur at the project site.

2.1 Biological Resource Reconnaissance

On July 27, 2012, Environmental Science Associates (ESA) biologist Matthew South conducted a biological resource reconnaissance survey to identify, map and characterize natural resources present or with the potential to occur on and adjacent to the proposed project site. During this reconnaissance, the biologist characterized and quantified onsite and adjacent plant communities and habitats according to *Preliminary Descriptions of the Terrestrial Natural Communities of California*. Common plant names are taken from J.C. Hickman (1993).

[1] The California Department of Fish and Game (CDFG) changed its name on January 1, 2013 to The California Department of Fish and Wildlife (CDFW). In this document, references to literature published by CDFW prior to Jan. 1, 2013 are cited as 'CDFG'. The agency is otherwise referred to by its new name, CDFW.

The biological reconnaissance survey was conducted between 1100 and 1400. Weather conditions at the time of the survey were sunny with an average temperature of 80 degrees Fahrenheit (ºF) and wind speeds ranging from zero to five miles per hour (mph).

2.2 Special-Status Species Habitat Assessment

The reconnaissance survey included a preliminary assessment of habitat for the special-status species that, based on available data, have known occurrences in the vicinity of the project site.

2.3 Jurisdictional Waters and Wetlands Investigation

An investigation of potentially jurisdictional waters and wetlands was conducted to determine the location and size of the areas that could be defined as waters of the U.S. (WoUS), waters of the State (WoS), wetlands, or riparian habitat. Preliminary identification of potential jurisdictional areas within the project site was based on U.S. Geological Survey (USGS) 7.5-minute topographical maps, *USDA Soil Survey Geographic Data Base* and *State Soil Geographic Data Base* soil maps, a review of both the *National Wetland Inventory* online mapper and the *FEMA flood zone* online mapper, and previous U.S. Army Corps of Engineers (USACE) jurisdictional determinations in the area. During the reconnaissance survey, ESA biologist Matthew South visually estimated the structure and composition of onsite streambeds and vegetation in order to identify all areas potentially under USACE or California Department of Fish and Wildlife (CDFW) jurisdiction. Active floodplains were identified using recent aerial photography and by identifying changes in the characteristics of vegetation and substrate composition.

3. Natural Resource Setting

The project site is located in the San Joaquin Valley and in Kern County near the cities of Bakersfield, Wasco, McFarland and Shafter and within the Pacific Flyway.[2] This area is also located within the California Floristic Province (CA-FP), Great Central Valley (GV) Region, San Joaquin Valley (SnJV) Subregion (Hickman, 1993). The CA-FP is the largest geographic unit in California and comprises much of the state west of the dry regions of the Great Basin (GB) and Desert (D) Provinces in northern and southern California (Hickman, 1993). The GV Region is entirely contained within the CA-FP, is roughly the same area as the California Central Valley, and was once comprised of grassland (California prairie), marshes, extensive riparian woodlands, and islands of valley-oak savanna, but is now predominantly agricultural (Hickman, 1993). The GV Region is divided into two subregions: the Sacramento Valley (ScV) Subregion to the north and the SnJV Subregion to the south (Hickman, 1993). The SnJV Subregion is the larger subregion and is hotter and drier than the ScV Subregion with desert elements in the south (Hickman, 1993). Land use within the vicinity of the proposed project is primarily agriculture.

As discussed previously, the project site consists of the Stockdale East property and the Stockdale West property and is almost entirely developed for agricultural and water recharge purposes, with only a small portion of the Stockdale West property left undisturbed. The majority of the

[2] The Pacific Flyway is an established air route of waterfowl and other birds migrating between wintering grounds in Central and South America and nesting grounds in Pacific Coast and provinces of North America.

Stockdale East property is currently used for agriculture supporting crops such as onion (*Allium* sp.), alfalfa (*Medicago sativa*), and squash (*Cucurbita* sp.) (Photos 1 and 2 below). The southwest corner of the property has been left fallow (Photo 3). Several structures and open storage areas comprised of bare ground have been developed for the operation and maintenance of the fields. There is also a small vegetated recharge basin in the northwest corner of the property (Photo 5). Several residential houses and buildings associated with surrounding agricultural land uses occur to the north of the property, across Stockdale Highway. Agriculture, as well as a railroad track and loading station associated with a local business, occur to the east of the property. The Pioneer Canal directly abuts the southern boundary and is dry during the summer months (Photo 6). The canal consists of an unpaved channel comprised of dirt and sandy soils dominated by weedy plant species, such as Russian thistle (*Salsola tragus*), which is typically found in disturbed areas. Its sandy berms provide habitat (breeding and foraging) for numerous local and migratory species of wildlife (Photo 8). South of the Pioneer Canal is the CVC; a paved canal with consistent, year-round water flow. The land south of the CVC is open land and includes recharge basins owned and maintained by the Kern Water Bank Authority Conservation Bank (KWBACB).

The recharge basins at the Stockdale West property are dominated by intentionally planted safflower (*Carthamus tinctorius*). The recharge basins are separated by elevated roads with culverts installed underneath each road, allowing water to flow between the basins. Adjacent lands north and west of the property are comprised mainly of agricultural fields. The area adjacent to the southwest corner of the property is undisturbed native Saltbush (*Atriplex* ssp.) Scrub (Holland 1986). A small area within the southwest portion of the western property boundary consists of non-native grassland (Holland 1986) (Photo 4). Directly south of the property is the Pioneer Canal and CVC, however a gap exists between the property and the canals that mostly consists of disturbed areas dominated by Russian thistle, but becomes the aforementioned undeveloped non-native grassland as it progresses west.

3.1 Climate

The climate of the proposed project area is characterized by hot, dry summers with daytime temperatures frequently above 100 degrees Fahrenheit (NOAA 2012). The winter months are cool and foggy with temperatures seldom below freezing and, on average, there are between 250 and 300 frost-free days per year. Average rainfall is less than 10 inches per year with the heaviest rains occurring between January and March (NOAA 2012).

3.2 Soils and Topography

In general, the topography of the project site is flat at approximately 310 feet above mean sea level (amsl). Soils on the project site are deep to very deep, well drained, with slow to moderately rapid permeability (NRCS 2012). Descriptions of the four soil types found within the project site are discussed below.

Excelsior Series

Excelsior sandy loam is mapped as occurring within the project site. The Excelsior series consists of very deep, well-drained soils on alluvial fans and bars and channels on flood plains with slopes

ranging from 0 to 2 percent. These soils allow negligible to medium runoff and moderate to slow permeability. The Excelsior series is used for irrigated cropland growing alfalfa, barley, cotton, and grapes; and for dairy and cattle production and building site development.

Kimberlina Series

Kimberlina fine sandy loam, 0 to 2 percent slopes, and Kimberlina sandy loam, 2 to 5 percent slopes are mapped as occurring within the project site. The Kimberlina series consists of deep, well drained soils on flood plains and recent alluvial fans on slopes from 0 to 9 percent. These soils allow negligible to medium runoff, and moderately rapid and moderate permeability. The Kimberlina series is used for growing irrigated field, forage, and row crops. Some areas are also used for livestock grazing. When not irrigated, the soils support annual grasses, forbs, and *Atriplex* ssp. in the San Joaquin Valley.

Wasco Series

Wasco fine sandy loam and Wasco sandy loam are mapped as occurring within the project site. The Wasco series consists of very deep, well-drained soils on recent alluvial fans and flood plain on 0 to 5 percent slopes. These soils allow negligible or very low runoff, and moderately rapid permeability. The Wasco series is used for growing field, forage, and row crops. Some areas are used for livestock grazing, wildlife habitat, recreation, and residential sites. Native vegetation supported by this series includes *Atriplex* spp., annual grasses, and forbs.

Westhaven Series

Westhaven fine sandy loam is mapped as occurring within the project site. The Westhaven series consists of very deep, well drained soils that formed in stratified mixed alluvium weathered from sedimentary and/or igneous rocks, on 0 to 5 percent slopes. These soils allow low runoff and moderately slow permeability. The Westhaven series is used for irrigated cropland to grow wheat, lettuce, cotton, tomatoes, almonds, grapes, and peaches. Native vegetation supported by this series includes *Atriplex* spp., and annual grasses and forbs.

3.3 Vegetation Communities and Habitat

Vegetation communities are assemblages of plant species that occur together in the same area. Three distinct plant communities are found on the project site: Developed Agriculture, Developed Recharge Basins, and non-native grassland (Holland 1986) (See **Figure 3**). A description and representative photograph of each vegetation community found at the project site is provided below.

Developed Agriculture

Developed Agriculture is not a vegetation community defined by Holland (1986). However, the majority of the Stockdale East property, and the parcels surrounding both properties, are agricultural land supporting orchards, row crops, and fallow land. Crops found within this vegetation community include alfalfa, onions, safflower, and squash divided by dirt access roads.

Several small areas of bare ground occur along the edges of the access roads where equipment and materials are being stored. Two cottonwood trees (*Populus fremontii*) and one unidentified ornamental tree occur in the southwestern portion of the Stockdale East property.

The total area for Developed Agriculture within the project boundaries equates to approximately 232.32 acres. This includes alfalfa, onions, squash, and fallow fields.

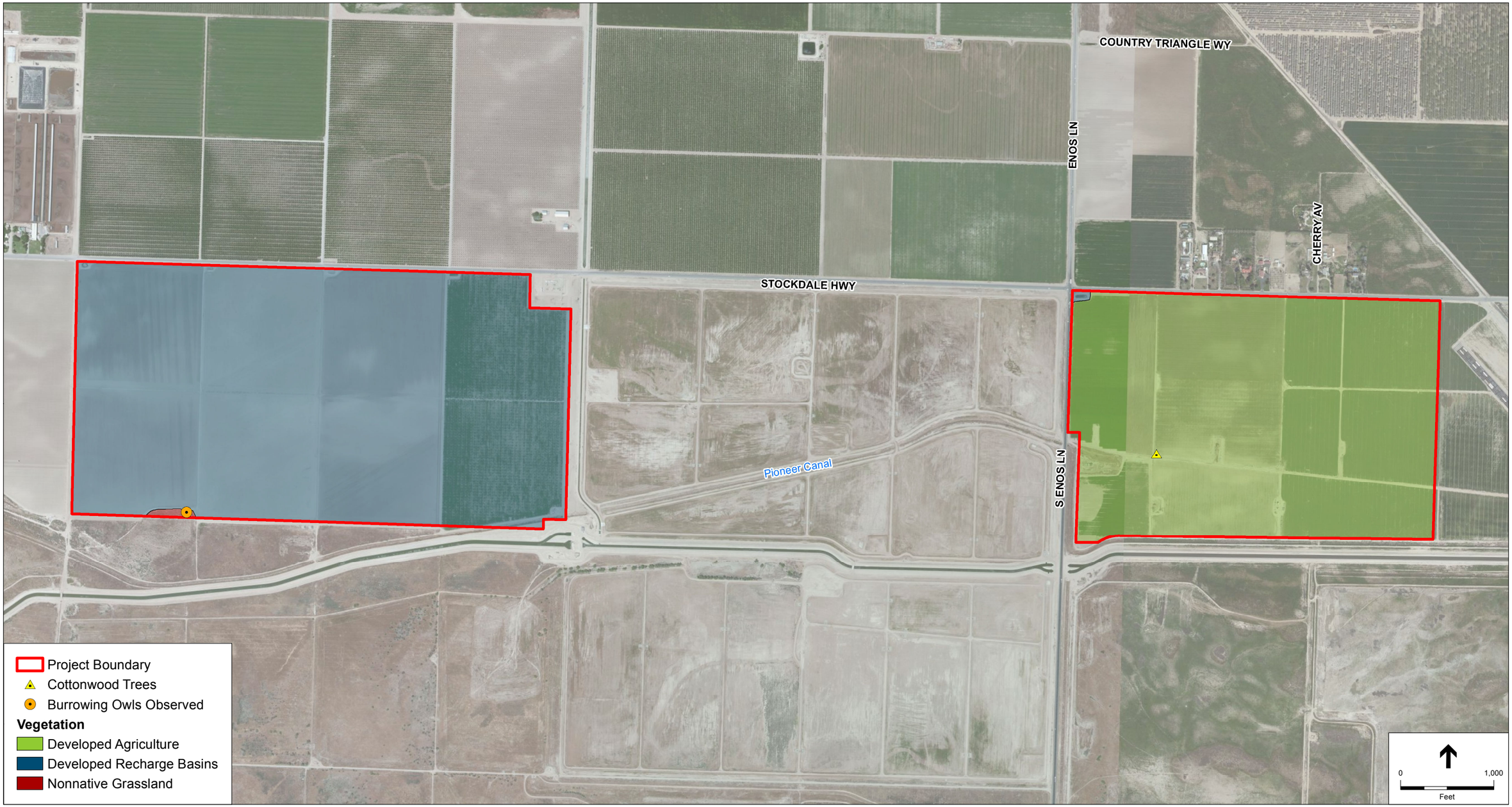
Developed Recharge Basins Land Cover

Developed Recharge Basin is not a vegetation community defined by Holland (1986). However, the majority of the Stockdale West property has been developed similar to Strand Ranch; it has been converted from agricultural fields into water basins planted with safflower. Raised access roads run between the basins with large culverts under each road to connect the basins. The culverts are reinforced with rip rap comprised of large rocks/boulders on both ends and around the road. There is also a small vegetated recharge basin in the northwest corner of the Stockdale East property.

The total area for Developed Recharge Basins within the project boundaries equates to approximately 329.5 acres. This area is dominated by a monoculture of safflower but has weedy, ruderal species such as Russian thistle in areas that are disturbed along the basin and road edges.

Non-native Grassland (Holland Code 42200)

A small sliver of non-native grassland occurs near the southwestern edge of the Stockdale West property and was elevated slightly above the rest of the landscape and adjacent access road. This area had sparse vegetation dominated by Arabian schismus (*Schismus arabicus*). The total area for Nonnative Grassland within the project boundaries equates to approximately 0.91 acre.



SOURCE:

Stockdale Integrated Banking Project . 211181

Figure 3

Vegetation Communities

This page left intentionally blank

Photo 1 – Photo depicts the alfalfa fields on the Stockdale East property

Photo 2 – Photo depicts the alfalfa fields on the Stockdale East property

Photo 3 – Photo depicts the fallow agricultural fields on the Stockdale East property

Photo 4 – Photo depicts the Non-natve Grassland in the southwest portion of the Stockdale West property

Photo 5 – Photo depicts the shallow vegetated water recharge basin in the northwest corner of the Stockdale East property

Photo 6 – Photo depicts the Pioneer Canal running along the southern boundary of the Stockdale East property

Photo 7 – Photo depicts the culverts associated with the water recharge basins on the Stockdale West property

Photo 8 – Photo depicts the potential kit fox burrow found in the canal wall just south of the Stockdale East property

3.4 Wildlife

Wildlife species observed at the project site are typical for the region. Nomenclature for wildlife species observed or expected to occur in the project area follow Jameson & Peeters (2004) for mammals, Jennings & Hayes (1994) and Stebbins (1985) for amphibians and reptiles, and Sibley (2003) for birds. Surveys conducted previously at Strand Ranch (ESA 2008) identified many common wildlife species that would be expected to occur at the project site because of the close proximity and similar habitat types found there. These are discussed below.

No amphibians or reptiles were observed during the survey. Reptiles not observed but expected to be present include California kingsnake (*Lampropeltis getula californiae*), long-tailed brush lizard (*Urosaurus graciosus*), glossy snake (*Arizona* elegans), and western diamondback (*Crotalus* atrox). Though a vegetated water recharge basin occurs in the northwest corner of Stockdale East, it is likely that this feature does not hold water perennially; therefore no suitable habitat for amphibians occurs and no amphibians were observed or are expected to occur at the project site.

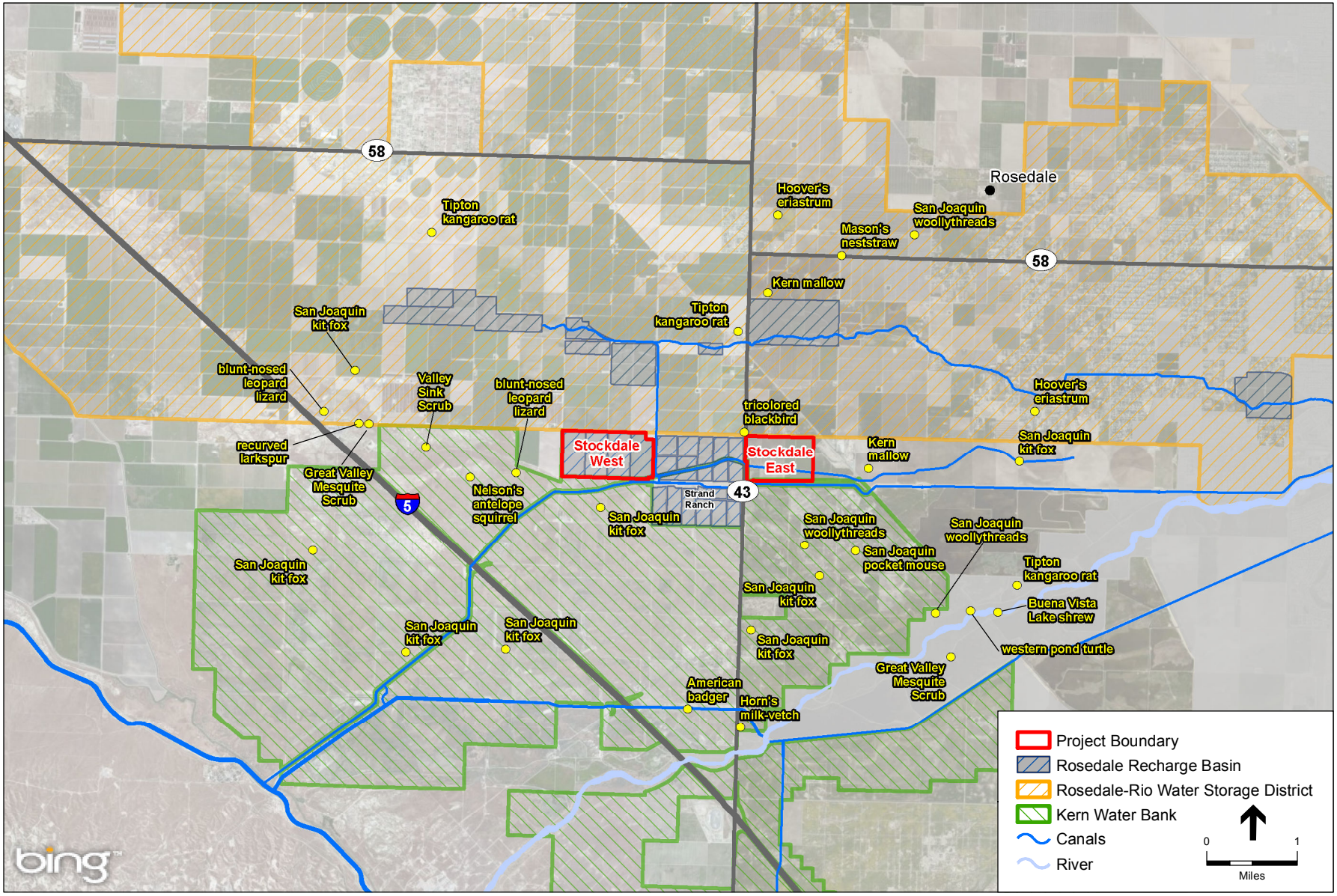
Mammals observed include, California ground squirrel (*Spermophilus beechyi*), and desert cottontail (*Sylvilagus audubonii*). A potential San Joaquin kit fox (*Vulpes macrotis mutica*) burrow was found in the canal wall just south of Stockdale East during the 2012 survey. The burrow occurs where the north-south road that bisects Stockdale East intersects the canal on the southern border just outside of the project boundaries. Other mammals not observed but expected to be present include mule deer (*Odocoileus hemionus*), desert kit fox (*Vulpes macrotis*), Gray fox (*Urocyon cinereoargenteus*), bobcat (*Lynx rufus*), round-tailed ground squirrel (*Spermophilus tereticaudus*), desert woodrat (*Neotoma lepida*), and other species of common mice and rats typical of the western Mojave Desert region.

The vegetation communities within the project site and immediate vicinity support a wide variety of resident, nesting, and migratory song birds typical of the region and habitat types present. The proposed project area also supports suitable foraging and hunting habitat for a number of raptors, including burrowing owl, red-tailed hawk (*Buteo jamaicensis*), and Swainson's hawk (*Buteo swainsoni*). Bird activity was low during the reconnaissance survey; observed avian species included burrowing owl and red-tailed hawk.

3.5 Special-Status Species and Natural Communities

Due to a general decline in population and habitat of certain species throughout California as a result of urbanization, agriculture, and industrial development, state and federal agencies, particularly the USFWS and CDFW, have listed a number of wildlife and plant species as threatened, endangered, or otherwise vulnerable to decline. Moreover, a number of state, federal, and local laws have been adopted to restrict and/or mitigate activities that could potentially impact a listed species or its habitat directly, indirectly, or cumulatively. Provided below in **Tables 1, 2,** and **3** is a list of special-status wildlife species, plant species, and natural communities, respectively, that have been previously recorded in the region according to the CNDDB and or the CNPS. A map depicting the approximate location of these recorded occurrences of these species is provided in **Figure 4**. The "Potential for Occurrence" category is defined as follows:

- **Unlikely:** The project site and/or immediate area do not support suitable habitat for a particular species, and therefore the project is unlikely to impact this species.
- **Low Potential:** The project site and/or immediate area only provide limited habitat for a particular species. In addition, the known range for a particular species may be outside of the immediate project area.
- **Medium Potential:** The project site and/or immediate area provide suitable habitat for a particular species, and proposed development may impact this species.
- **High Potential:** The project site and/or immediate area provide ideal habitat conditions for a particular species and/or known populations occur in the immediate area.
- **Present:** The species is know from the project site or was observed onsite during surveys.



SOURCE: CNDDB; Bing Maps; Kern County GIS, 2012.

Stockdale Integrated Banking Project . 211181

Figure 4

CNDDB Records within 3 miles of Project Site

TABLE 1
SPECIAL-STATUS WILDLIFE SPECIES WITH POTENTIAL TO OCCUR IN PROJECT AREA

Species	Status: Federal/State	Preferred Habitat	Probability of Occurrence in Project Area
Amphibians			
western spadefoot (*Spea hammondii*)	--/SSC	Prefers open areas with sandy or gravelly soils, in a variety of habitats including mixed woodlands, grasslands, chaparral, sandy washes, lowlands, river floodplains, alluvial fans, playas, alkali flats, foothills, and mountains. Rainpools which do not contain bullfrogs, fish, or crayfish are necessary for breeding.	**Low.** Suitable habitat exists on the project site. Only known occurrence record for the species was recorded in an irrigation ditch 4 miles east of the project site in 1996
Reptiles			
western pond turtle (*Emys marmorata*)	--/SSC	Ponds and small lakes with abundant vegetation. Also seen in marshes, slow-moving streams, reservoirs, and occasionally in brackish water.	**Unlikely.** The small recharge pond on the eastern property of the project site provides a very small amount of poor quality habitat, which is not capable of supporting a population of the species. The species has the potential to occur in the open water canals in the vicinity of the project. There are no occurrence records for the species in the vicinity of the project site.
silvery legless lizard (*Anniella pulchra pulchra*)	--/SSC	Sandy or loose loamy soils in chaparral, coastal dunes, and coastal scrub. Requires soils with high moisture content.	**Unlikely.** The project site does contain the loose loamy soils preferred by the species but the area does not support the preferred habitat for the species.
blunt-nosed leopard lizard (*Gambelia sila*)	FE/SE, FP	Blunt-nosed leopard lizards live in the San Joaquin Valley region in expansive, arid areas with scattered vegetation. Today they inhabit non-native grassland and alkali sink scrub communities of the Valley floor marked by poorly drained, alkaline, and saline soils, mainly because remaining natural land is of this type. Use small mammal burrows for permanent shelter and dormancy.	**Medium.** Suitable habitat on site (Nonnative Grassland) provides marginal habitat for the species on the project site; however the community is unlikely to support a population of the species. The Saltbush Scrub community in the vicinity of the project area provides higher quality habitat for the species. There is an occurrence record for the species within the vicinity of the project site.

TABLE 1
SPECIAL-STATUS WILDLIFE SPECIES WITH POTENTIAL TO OCCUR IN PROJECT AREA

Species	Status: Federal/State	Preferred Habitat	Probability of Occurrence in Project Area
San Joaquin whipsnake (*Masticophis flagellum ruddocki*)	--/SSC	Associated with open, dry habitats, with little to no tree cover; found in valley grassland and saltbush scrub in the San Joaquin valley. Species needs mammal burrows for refuge and ovipositor sites.	**Medium.** Suitable habitat exists on the project site and in the vicinity of the project site. There are 5 occurrence records for the species in the vicinity of the project site.
coast horned lizard (*Phrynosoma blainvillii*)	--/SSC	Found in a wide variety of vegetation types including coastal sage scrub, annual grassland, chaparral, oak woodland, riparian woodland and coniferous forest.	**Low.** Minimal suitable habitat for the species exists in the Nonnative Grassland on the project site.
giant garter snake (*Thamnophis gigas*)	FT/ST	Ideal habitat would be characterized as having dense emergent vegetation for escape from predation, deep and shallow pools of water (which persist throughout the seasonal cycle of activity) in which to forage and seek cover, open areas along the margins to allow for basking, and upland habitat with access to structures suitable for hibernation and escape from flooding.	**Low.** Suitable habitat exists on the project site and immediate vicinity. The species has been recorded on two occasions within four miles of the project site.
Birds			
tricolored blackbird (*Agelaius tricolor*)	--/SSC	Tricolored blackbirds have three basic requirements for selecting their breeding colony sites: open, accessible water; a protected nesting substrate, including flooded, thorny, or spiny vegetation; and a suitable foraging space providing adequate insect prey within a few miles of the nesting colony.	**High** Open water canals and agriculture on and near the project site can support this species. This species was observed foraging in the region by ESA biologists during surveys conducted for an unrelated project. The species is known to occur within and adjacent to the project site according to the CNDDB
burrowing owl (*Athene cunicularia*)	--/SSC	Found in open, dry grasslands, agricultural and range lands, and desert habitats often associated with burrowing animals, particularly prairie dogs, ground squirrels and badgers.	**Present.** Three individuals of this species were observed utilizing burrows within the Nonnative Grasslands on the western property of the project site during the 2012 survey of the project area.

TABLE 1
SPECIAL-STATUS WILDLIFE SPECIES WITH POTENTIAL TO OCCUR IN PROJECT AREA

Species	Status: Federal/State	Preferred Habitat	Probability of Occurrence in Project Area
Swainson's hawk *(Buteo swainsoni)*	--/ST	Forages in a wide variety of open habitats, ranging from prairie and shrublands to desert and intensive agricultural systems. Within California, the species is strongly associated with riparian areas within desert, shrubsteppe, grassland, and agricultural habitats.	**Medium.** The species has been observed foraging in the vicinity of the project area during surveys conducted by ESA biologists for an unrelated project. The species is unlikely to nest in the immediate vicinity of the project site due to the lack of suitable nesting substrata; although two cottonwood trees exist on the project site, no raptor nests were observed during the 2012 survey.
western snowy plover (*Charadrius alexandrines nivosus*)	FT/SSC	Nest beside or near tidal waters, and nesting colonies are found on the mainland coast, peninsulas, offshore islands, adjacent bays and estuaries from southern Washington to southern Baja California, Mexico.	**Unlikely.** The species is believed to be extirpated from the region. The species' only occurrence record in the vicinity of the project area was recorded in 1912.
mountain plover (*Charadrius montanus*)	--/SSC	Favored habitats include prairie dog towns, areas heavily grazed by domestic livestock or wild herbivores, bare ground areas near artificial watering structures, recently burned or mowed areas, and recently fallowed or tilled crop fields. Found in grasslands, freshly plowed and newly sprouting grain fields, and sod farms. Prefers grazed areas and areas with burrowing rodents.	**Low.** The project site provides suitable habitat for the species; however, the only occurrence for the species in the vicinity of the project area was recorded over 20 years ago.
western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)	FC/SE	Prefers open woodlands with clearings and a dense shrub layer. They are often found in woodlands near streams, rivers or lakes.	**Unlikely.** The project vicinity does not provide suitable habitat for the species. The only occurrence record for the species in the vicinity of the project area was recorded in 1922.
Fulvous whistling-duck (*Dendrocygna bicolor*)	--/SSC	Rice fields, swamplands, marshes with lots of reeds and swamp vegetation.	**Unlikely.** The project vicinity does not provide suitable habitat for the species. The only occurrence record for the species in the vicinity of the project area was recorded in 1922.

TABLE 1
SPECIAL-STATUS WILDLIFE SPECIES WITH POTENTIAL TO OCCUR IN PROJECT AREA

Species	Status: Federal/State	Preferred Habitat	Probability of Occurrence in Project Area
white-tailed kite (*Elanus leucurus*)	--/FP	Found in rolling foothills, and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodlands. Foraging habitat includes open grasslands, meadows, or marshes close to dense topped trees for nesting and perching	**Unlikely.** The project vicinity does not provide suitable habitat for the species. The only occurrence record for the species in the vicinity of the project area was recorded in 1992.
white-faced ibis (*Plegadis chihi*)	--/SSC	Frequents marshes, swamps, ponds and rivers.	**Unlikely.** Suitable habitat for this species is not present on the project site.
Le Conte's thrasher (*Toxostoma lecontei*)	--/SSC	Generally found in open desert scrub, alkali desert scrub, and desert succulent scrub. In the San Joaquin Valley, the species is found primarily in habitats dominated by saltbush, and often frequents desert washes and flats with scattered saltbush.	**Low.** The species may occur in the vicinity of the project site, but is unlikely to occur within the project boundaries due to the low quality and minimal availability of suitable habitat.
yellow-headed blackbird (*Xanthocephalus xanthocephalus*)	--/SSC	Nests in freshwater emergent wetlands in dense vegetation and deep water, often along lakes or ponds. Nests only where large insects, such as coonata are abundant, nesting is timed with emergence of aquatic insects.	**Unlikely.** Minimal suitable habitat exists within the project site and the only occurrence record for the species in the region was recorded in 1923.
Mammals			
Nelson's antelope squirrel (*Ammospermophilus nelsoni*)	--/ST	In the southern and western San Joaquin Valley, San Joaquin antelope squirrels are associated with open, gently sloping land with shrubs. Typical vegetation includes saltbushes and *Ephedra* sp. and sparsely vegetated, loamy soils.	**Medium.** Suitable habitat for the species exists on the project site. The species has been recorded within a mile of the project site.
giant kangaroo rat (*Dipodomys ingens*)	FE/SE	Prefer annual grassland on gentle slopes of generally less than 10 degrees, with friable, sandy-loam soils in the San Joaquin Valley.	**Low.** The species may occur in the vicinity of the project, but is unlikely to occur within the project boundaries. The Nonnative Grassland and fallow agricultural fields on the project site provide minimal suitable habitat for the species. There are no records of the species occurring within five miles of the project site.

TABLE 1
SPECIAL-STATUS WILDLIFE SPECIES WITH POTENTIAL TO OCCUR IN PROJECT AREA

Species	Status: Federal/State	Preferred Habitat	Probability of Occurrence in Project Area
short-nosed kangaroo rat (*Dipodomys nitratoides brevinasus*)	--/SSC	Found in the western San Joaquin Valley; mostly on flat and gently sloping terrain and on hilltops in desert-shrub associations, primarily saltbushes and California ephedra.	**Low.** The species may occur in the vicinity of the project, but is unlikely to occur within the project boundaries. The Nonnative Grassland and fallow agricultural fields on the project site provide minimal suitable habitat for the species. There are no records of the species occurring within five miles of the project site.
Tipton's kangaroo rat (*Dipodomys nitratoides nitratiodes*)	FE/SE	Limited to arid-land communities occupying the Valley floor of the Tulare Basin of the San Joaquin Valley, on level or nearly level terrain.	**Medium.** Suitable habitat for the species exists within the project boundaries. The species has been known to occur within one mile of the project site.
western mastiff bat (*Eumops perotis californicus*)	--/SSC	Found in open, semi-arid to arid habitats including conifer and deciduous woodlands, coastal scrub, grasslands, chaparral, etc. Roosts in crevices in cliff faces, high buildings, trees and tunnels.	**Low.** The project area does not provide suitable roosting habitat and provides marginal foraging habitat. The occurrence records for the species in the vicinity include a single occurrence, with unknown details of observer or date observed, that was added to the CNDDB in 2006, and a second occurrence record from 1959.
Tulare grasshopper mouse (*Onychomys torridus tularensis*)	--/SSC	Tulare grasshopper mice typically inhabit arid shrubland communities in hot, arid grassland and shrubland associations.	**Low.** The species may occur in the vicinity of the project, but is unlikely to occur within the project boundaries. The Nonnative Grassland and fallow agricultural fields on the project site provide minimal suitable habitat for the species. The species has not been recorded within 5 miles of the project site.
Buena Vista Lake shrew (*Sorex ornatus relictus*)	FE/SSC	Occupies the marshlands of the San Joaquin Valley and the Tulare Basin.	**Unlikely.** Suitable habitat for this species is not present on the project site.
American badger (*Taxidea taxus*)	--/SSC	Prefers to live in dry, open grasslands, farmlands, fields, and pastures	**High.** Ideal habitat for this species exists on the project site and ESA biologists have observed the species in the immediate vicinity of the project site during surveys conducted for other projects.

TABLE 1
SPECIAL-STATUS WILDLIFE SPECIES WITH POTENTIAL TO OCCUR IN PROJECT AREA

Species	Status: Federal/State	Preferred Habitat	Probability of Occurrence in Project Area
San Joaquin kit fox (*Vulpes macrotis mutica*)	FE/ST	Include grasslands and scrublands with active oil fields, wind turbines, and an agricultural matrix of row crops, irrigated pasture, orchards, vineyards, and grazed annual grasslands (non-irrigated pasture).	**High.** A potential burrow was found in the canal wall just south of the eastern property during the 2012 survey. There is also ideal habitat for this species on the project site and there is a record of the species occurring within or immediately adjacent to the project area. There is an additional 147 occurrence records of the species within the vicinity of the project site.

1. Federal status: USFWS Listing, other non-CA specific listing
   - **FE** = Listed as endangered under the federal Endangered Species Act (ESA)
   - **FT** = Listed as threatened under ESA

2. State status: CDFW Listing
   - **SE** = Listed as endangered under the California Endangered Species Act (CESA)
   - **ST** = Listed as threatened under the CESA
   - **SSC** = Species of Special Concern as identified by the CDFW
   - **FP** = Listed as fully protected under California Fish and Game Code

3. Habitat description: Habitat description information from the California Wildlife Habitat Relationships System maintained by the CDFW

SOURCES: USFWS 2012; CDFG 2012

Table 2 includes a list of rare and special-status plants that have been recorded in the region of the proposed project site and briefly describes the habitat suitability required for each plant species.

TABLE 2
RARE PLANTS WITH POTENTIAL TO OCCUR IN PROJECT AREA

Species	Status/ CNPS List	Growth Habit	Elevation (m)	Habitat	Flowering Period	Probability of Occurrence in Project Area
Horn's milk-vetch *Astragalus hornii* var. *hornii*	--/1B.1	annual herb	60 - 850	Meadows and seeps, Playas/lake margins in alkaline soils.	May - Oct	**Unlikely**. Suitable habitat for this species is not present on the project site.
heartscale *Atriplex cordulata* var. *cordulata*	--/1B.2	annual herb	0 – 560	Chenopod scrub, Meadows and seeps, Valley and foothill grassland in sandy/saline or alkaline soils.	Apr - Oct	**Low**. Suitable soils for this species exist on portions of the project site but the habitat on site is marginal at best.
Lost Hills crownscale *Atriplex coronata* var. *vallicola*	--/1B.2	annual herb	50 – 635	Chenopod scrub, Valley and foothill grassland, Vernal pools in alkaline soils.	Apr - Aug	**Low**. Suitable soils for this species exist on portions of the project site but the habitat on site is marginal at best.
lesser saltscale *Atriplex minuscula*	--/1B.1	annual herb	15 – 200	Chenopod scrub, Playas, Valley and foothill grassland in alkaline or sandy soils.	May - Oct	**Low**. Suitable soils for this species exist on portions of the project site but the habitat on site is marginal at best.
subtle orache *Atriplex subtilis*	--/1B.2	annual herb	40 – 100	Valley and foothill grassland.	Jun - Aug (Oct)	**Low**. Suitable soils for this species exist on portions of the project site but the habitat on site is marginal at best.
Bakersfield smallscale *Atriplex tularensis*	SE/1A	annual herb	90 - 200	Chenopod scrub.	Jun - Oct	**Low**. Suitable soils for this species exist on portions of the project site but the habitat on site is marginal at best.
alkali mariposa lily *Calochortus striatus*	--/1B.2	perennial bulbiferous herb	70 – 1595	Chaparral, Chenopod scrub, Mojavean desert scrub, Meadows and seeps in alkaline/ mesic soils.	Apr - Jun	**Unlikely**. Suitable habitat for this species is not present on the project site.

TABLE 2
RARE PLANTS WITH POTENTIAL TO OCCUR IN PROJECT AREA

Species	Status/ CNPS List	Growth Habit	Elevation (m)	Habitat	Flowering Period	Probability of Occurrence in Project Area
California jewel-flower *Caulanthus californicus*	FE, SE/1B.1	annual herb	61 – 1000	Chenopod scrub, Pinyon and juniper woodland, and Valley and foothill grassland in sandy soils.	Feb - May	**Low**. Suitable habitat for this species occurs in the Nonnative Grassland on site but is marginal at best.
hispid bird's-beak *Chloropyron molle* ssp. *hispidum*	--/1B.1	annual herb	1 - 155	Alkaline soils supporting Meadows and seeps, Playas, and Valley and foothill grasslands.	Jun - Sep	**Low**. Suitable habitat for this species occurs in the Nonnative Grassland on site but is marginal at best.
slough thistle *Cirsium crassicaule*	--/1B.1	annual/perennial herb	3 – 100	Chenopod scrub, Marshes and swamps(sloughs), and Riparian scrub.	May - Aug	**Unlikely**. Suitable habitat for this species is not present on the project site.
recurved larkspur *Delphinium recurvatum*	--/1B.2	perennial herb	3 – 750	Chenopod scrub, Cismontane woodland, and Valley and foothill grassland in alkaline soils.	Mar - Jun	**Low**. Suitable habitat for this species occurs in the Nonnative Grassland on site but is marginal at best.
Kern mallow *Eremalche kernensis*	FE/1B.1	annual herb	70 – 1290	Chenopod scrub and Valley and foothill grassland.	Mar - May	**Low**. Suitable habitat for this species occurs in the Nonnative Grassland on site but is marginal at best.
Hoover's eriastrum *Eriastrum hooveri*	FD/4.2	annual herb	50 - 915	Gravelly soils supporting Chenopod scrub, Pinyon and juniper woodland, and Valley and foothill grassland.	Mar - Jul	**Low**. Suitable habitat for this species occurs in the Nonnative Grassland on site but is marginal at best.
Tejon poppy *Eschscholzia lemmonii* ssp. *kernensis*	--/1B.1	annual herb	160 – 1000	Chenopod scrub and Valley and foothill grassland.	Mar - May	**Low**. Suitable habitat for this species occurs in the Nonnative Grassland on site but is marginal at best.
Coulter's goldfields *Lasthenia glabrata* ssp. *coulteri*	--/1B.1	annual herb	1 – 1220	Marshes and swamps (coastal salt), Playas, and Vernal pools.	Feb - Jun	**Unlikely**. Suitable habitat for this species is not present on the project site.
San Joaquin woollythreads *Monolopia congdonii*	FE/1B.2	annual herb	60 – 800	Chenopod scrub and Valley and foothill grassland in sandy soils.	Feb - May	**Low**. Suitable habitat for this species occurs in the Nonnative Grassland on site but is marginal at best.
Bakersfield cactus *Opuntia basilaris* var. *treleasei*	FE, SE/1B.1	perennial stem succulent	120 - 1140	Sandy or gravelly soils supporting Chenopod scrub, Cismontane woodland, and Valley and foothill grasslands.	Apr - May	**Unlikely**. Suitable habitat for this species is not present on the project site.

TABLE 2
RARE PLANTS WITH POTENTIAL TO OCCUR IN PROJECT AREA

Species	Status/ CNPS List	Growth Habit	Elevation (m)	Habitat	Flowering Period	Probability of Occurrence in Project Area
California chalk moss *Pterygoneurum californicum*	--/1B.1	ephemeral moss	10 - 100	Chenopod scrub and Valley and foothill grassland in alkali soils	N/A	**Low**. Suitable habitat for this species occurs in the Nonnative Grassland on site but is marginal at best.
oil neststraw *Stylocline citroleum*	--/1B.1	annual herb	50 – 400	Chenopod scrub, Coastal scrub, Valley and Foothill grassland in clay soils.	Mar - Apr	**Low**. Suitable habitat for this species occurs in the Nonnative Grassland on site but is marginal at best.
Mason's neststraw *Stylocline masonii*	--/1B.1	annual herb	100 - 1200	Chenopod scrub and Pinyon and juniper woodland in sandy soils.	Mar - May	**Unlikely**. Suitable habitat for this species is not present on the project site.

CNPS Status

List 1B = Plants Rare, Threatened, Endangered in California and elsewhere

List 2 = Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere

List 4 = Plants of Limited Distribution - A Watch List

Threat ranks

.1 = seriously Endangered in California

.2 = fairly Endangered in California

.3 = Not very threatened in California (low degree/immediacy of threats or no current threats known)

Table 3 includes a list of sensitive or rare natural communities that have been recorded in the region of the project site and provides a brief description of the community and a short discussion of its presence on the project site.

TABLE 3
NATURAL COMMUNITIES OFSPECIAL CONCERN

Community Name	CNDDB Element Rank: Global/State	Community Description (Holland, 1986)	Presence on Project Site
Great Valley Cottonwood Riparian Forest	G2/S2.1	A dense, broad-leafed, winter-deciduous riparian forest dominated by cottonwood trees (*Populus fremontii*) and Gooding's willow (*Salix goodingii*). Understories are dense, with abundant vegetative reproduction of canopy dominants. Found at sites with fine-grained alluvial soils near perennial or nearly perennial streams that provide subsurface irrigation even when the channel is dry.	**Absent.** This community was not observed within the project boundaries during a survey of the project site.
Great Valley Mesquite Scrub	G1/S1.1	An open woodland or savanna dominated by honey mesquite (*Prosopis glandulosa torreyana*) and alkali saltbush (*Atriplex polycarpa*). Understories are grassy in good rainfall years, though usually dominated by introduced annuals. Perennial cover usually is low. Found at sites with sandy loam soils of alluvial origin.	**Absent.** This community was not observed within the project boundaries during a survey of the project site.
Valley Sacaton Grassland	G1/S1.1	Midheight (to 3 feet) tussock-forming grassland dominated by alkali Sacaton (*Sporobolus airoides*). Found at sites with fine-textured, poorly drained, usually alkali soils. Most sites have seasonally high water tables or are overflowed during winter flooding.	**Absent.** This community was not observed within the project boundaries during a survey of the project site.
Valley Saltbush Scrub	G2/S2.1	Open, gray or blue-green chenopod scrubs (10-40% cover), usually over a low herbaceous annual understory. Cover types dominated by alkali saltbush or spiny saltbush (*Atriplex spinifera*). Typically found at sites with sandy to loamy soils without surface alkalinity; largely on rolling, dissected alluvial fans with low relief.	**Absent.** This community was not observed within the project boundaries during a survey of the project site.
Valley Sink Scrub	G1/S1.1	Low, open to dense succulent shrublands dominated by alkali-tolerant Chenopodiaceae, especially iodine bush (*Allenrolfea occidentalis*) or several *Sueda* species. Understories usually are lacking, though sparse herbaceous cover dominated by red brome (*Bromus rubens*) develop occasionally. Found at sites with heavy, saline and/or alkaline clays of lakebeds or playas. Soil surfaces often have a brilliant white salty crust over dark, sticky clay.	**Absent.** This community was not observed within the project boundaries during a survey of the project site.

Global Ranking	The global rank (G-rank) is a reflection of the overall condition of an element throughout its global range.
Species or Community Level	G1 = Less than 6 viable element occurrences (EOs) OR less than 1,000 individuals OR less than 2,000 acres. G2 = 6-20 EOs OR 1,000-3,000 individuals OR 2,000-10,000 acres.
State Ranking	The state rank (S-rank) is assigned much the same way as the global rank, except state ranks in California often also contain a threat designation attached to the S-rank. S1 = Less than 6 EOs OR less than 1,000 individuals OR less than 2,000 acres S1.1 = very threatened S2 = 6-20 EOs OR 1,000-3,000 individuals OR 2,000-10,000 acres S2.1 = very threatened SNR = National, sub-national, or State conservation status not yet assessed.

3.6 Connectivity and Wildlife Movement Corridors

Habitat linkages provide a connection between two or more habitat areas that are often larger or superior in quality to the linkage. Such linkages can be quite small or constricted, but can be vital to the long-term health of connected habitats. Wildlife movement corridors are features that allow wildlife movement between patches of habitat, allowing for dispersal and genetic interchange. The Pioneer Canal and CVC to the south of the project areas provide opportunities for wildlife movement. In addition, the project area connects to an adjacent area of open space, the KWBACB, along the southern borders of the properties, and thus linkage value is deemed high quality.

4. Regulatory Framework

The proposed project is subject to a number of federal, state, and local regulations regarding biological resources. A summary of the primary regulations pertaining to the proposed project is provided below.

4.1 Federal

Federal Endangered Species Act

Under the federal Endangered Species Act (FESA), the Secretary of the Interior and the Secretary of Commerce jointly have the authority to list a species as threatened or endangered (16 USC 1533(c)). Pursuant to the requirements of FESA, an agency reviewing a proposed project within its jurisdiction must determine whether any federally listed or proposed species may be present in the project region and determine whether the proposed project would have a potentially significant impact on such species. In addition, the agency is required to determine whether the project is likely to jeopardize the continued existence of any species proposed to be listed under FESA or result in the destruction or adverse modification of critical habitat proposed to be designated for such species (16 USC 1536(3), (4)). Project-related impacts to these species or their habitats would be considered "significant." Section 7 of FESA contains a "take" prohibition which prohibits any action conducted, funded, or approved by a federal agency that adversely affects a member of an endangered or threatened species without prior formal consultation with the USFWS. Formal consultation with the USFWS would result in the issuance of a Biological Opinion (BO) that includes either a jeopardy or non-jeopardy decision issued by the USFWS to the consulting federal agency. The BO would also include the possible issuance of an "incidental take" permit. If such authorization is given, the project proponent must provide the USFWS with a Habitat Conservation Plan (HCP) for the affected species and publish notification of the application for a permit in the Federal Register.

Section 4(a)(3) and (b)(2) of the FESA requires the designation of critical habitat to the maximum extent possible and prudent based on the best available scientific data and after considering the economic impacts of any designations. Critical habitat is defined in section 3(5)(A) of the FESA as (1) areas within the geographic range of a species that are occupied by individuals of that species and contain the primary constituent elements (physical and biological features) essential

to the conservation of the species, thus warranting special management consideration or protection, and (2) areas outside of the geographic range of a species at the time of listing but that are considered essential to the conservation of the species.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA), first enacted in 1918, domestically implements a series of treaties between the United States and Great Britain (on behalf of Canada), Mexico, Japan, and the former Soviet Union that provide for international migratory bird protection. The MBTA authorizes the Secretary of the Interior to regulate the taking of migratory birds; the act provides that it shall be unlawful, except as permitted by regulations, "to pursue, take, or kill any migratory bird, or any part, nest or egg of any such bird…" (U.S. Code Title 16, Section 703). This prohibition includes both direct and indirect acts, although harassment and habitat modification are not included unless they result in direct loss of birds, nests, or eggs. The current list of species protected by the MBTA includes several hundred species and essentially includes all native birds. Permits for take of nongame migratory birds can be issued only for specific activities, such as scientific collecting, rehabilitation, propagation, education, taxidermy, and protection of human health and safety and personal property.

Clean Water Act

Section 404 and Wetlands

In accordance with Section 404 of the federal Clean Water Act (CWA), the USACE regulates discharge of dredged or fill material into waters of the United States. Waters of the United States and their lateral limits are defined in Title 33, Part 328.3(a) of the Code of Federal Regulations to include navigable waters of the United States, interstate waters, all other waters subject to the ebb and flow of the tide, and all other waters where the use or degradation or destruction of the waters could affect interstate or foreign commerce, tributaries to any of these waters, and wetlands that meet any of these criteria or that are adjacent to any of these waters or their tributaries. Waters of the United States are often categorized as "jurisdictional wetlands" (i.e., wetlands over which USACE exercises jurisdiction under Section 404) and "other waters of the United States" when habitat values and characteristics are being described. "Fill" is defined as any material that replaces any portion of a water of the United States with dry land or that changes the bottom elevation of any portion of a water of the United States. Any activity resulting in the placement of dredged or fill material within waters of the United States requires a permit from USACE.

Wetlands are a subset of "waters of the United States" and receive protection under Section 404 of the CWA. Wetlands are defined by the federal government (CFR, Section 328.3(b), 1991) as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Waters of the U.S. do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the CWA, the final authority regarding CWA jurisdiction remains with U.S. Environmental Protection Agency (EPA) (328.3(a)(8) added 58 FR 45035, August 25, 1993).

The USACE regulates the discharge of dredged or fill material into waters of the United States under Section 404 of the Clean Water Act. As described in Section 5.3.1 of this report, the jurisdictional delineation performed for the study area determined that no USACE jurisdictional wetlands are present on or adjacent to the project site.

Section 401

Under Section 401 of the federal CWA, the Central Valley Regional Water Quality Control Board (RWQCB) must certify that actions receiving authorization under section 404 of the CWA also meet state water quality standards.

Porter-Cologne Water Quality Control Act

Under the Porter-Cologne Water Quality Control Act, waters of the state fall under the jurisdiction of the appropriate RWQCB. Under the act, the RWQCB must prepare and periodically update water quality control basin plans. Each basin plan sets forth water quality standards for surface water and groundwater, as well as actions to control nonpoint and point sources of pollution to achieve and maintain these standards. Projects that affect wetlands or waters must meet waste discharge requirements of the RWQCB, which may be issued in addition to a water quality certification or waiver under Section 401 of the CWA. The RWQCB requires projects to avoid impacts to wetlands if feasible and requires that projects do not result in a net loss of wetland acreage or a net loss of wetland function and values. The RWQCB typically requires compensatory mitigation for impacts to wetlands and/or waters of the state. The RWQCB also has jurisdiction over waters deemed 'isolated' or not subject to Section 404 jurisdiction under *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers* (SWANCC)[3]. Dredging, filling, or excavation of isolated waters constitutes a discharge of waste to waters of the state and prospective dischargers are required obtain authorization through an Order of Waste Discharge or waiver thereof from the RWQCB and comply with other requirements of Porter-Cologne Act.

4.2 State

CEQA Guidelines Section 15380

Although threatened and endangered species are protected by specific federal and state statutes, *CEQA Guidelines* Section 15380(b) provides that a species not listed on the federal or state list of protected species may be considered rare or endangered if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definition in FESA and the section of the California Fish and Game Code dealing with rare or endangered plants or animals. This section was included in CEQA primarily to deal with situations in which a public agency is

[3] Based on the Supreme Court ruling (SWANCC) concerning the Clean Water Act jurisdiction over isolated waters (January 9, 2001), non-navigable, isolated, intrastate waters based solely on the use of such waters by migratory birds are no longer defined as waters of the United States. Jurisdiction of non-navigable, isolated, intrastate waters may be possible if their use, degradation, or destruction could affect other waters of the Unites States, or interstate or foreign commerce. Jurisdiction over such other waters are analyzed on a case-by-case basis. Impoundments of waters, tributaries of waters, and wetlands adjacent to waters should be analyzed on analyzed on a case-by-case basis.

reviewing a project that may have a significant effect on, for example, a candidate species that has not been listed by either USFWS or CDFW. Thus, CEQA provides an agency with the ability to protect a species from the potential impacts of a project until the respective government agencies have an opportunity to designate the species as protected, if warranted. CEQA also calls for the protection of other locally or regionally significant resources, including natural communities. Although natural communities do not at present have legal protection of any kind, CEQA calls for an assessment of whether any such resources would be affected, and requires findings of significance if there would be substantial losses. Natural communities listed by CNDDB as sensitive are considered by CDFW to be significant resources and fall under the *CEQA Guidelines* for addressing impacts. Local planning documents such as general plans often identify these resources as well.

State Endangered Species Act (CESA)

Under CESA, the CDFW is responsible for maintaining a list of threatened and endangered species (California Fish and Game Code 2007), candidate species, and species of special concern. Pursuant to the requirements of CESA, an agency reviewing a proposed project within its jurisdiction must determine whether any state listed endangered or threatened species may be present on the project region and determine whether the proposed project would have a potentially significant impact on such species. In addition, the CDFW encourages informal consultation on any proposed project that may impact a candidate species. If there were project-related impacts to species on the CESA threatened and endangered list, they would be considered "significant." Impacts to "species of concern" would be considered "significant" under certain circumstances, discussed below.

State Fish and Game Code

Section 2080 - Threatened and Endangered Species

Section 2080 of the State Fish and Game Code states, "No person shall import into this state [California], export out of this state, or take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the commission [State Fish and Game Commission] determines to be an endangered species or threatened species, or attempt any of those acts, except as otherwise provided in this chapter, or the Native Plant Protection Act, or the California Desert Native Plants Act." Pursuant to Section 2081 of the Code, the CDFW may authorize individuals or public agencies to import, export, take, or possess, any state-listed endangered, threatened, or candidate species. These otherwise prohibited acts may be authorized through permits or Memoranda of Understanding if: (1) the take is incidental to an otherwise lawful activity; (2) impacts of the authorized take are minimized and fully mitigated; (3) the permit is consistent with any regulations adopted pursuant to any recovery plan for the species; and (4) the applicant ensures adequate funding to implement the measures required by CDFW. The CDFW makes this determination based on available scientific information and considers the ability of the species to survive and reproduce. Due to the potential presence of state-listed rare, threatened, or endangered species on the project site, Sections 2080 and 2081 of the Code were considered in this evaluation.

Section 3503 – Nesting Birds and Raptors

Section 3503 of the California Fish and Game Code states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird. Section 3503.5 specifically states that it is unlawful to take, possess, or destroy any raptors (i.e., species in the orders Falconiformes and Strigiformes), including their nests or eggs. Typical violations of these codes include destruction of active nests resulting from removal of vegetation in which the nests are located. Violation of Section 3503.5 could also include failure of active raptor nests resulting from disturbance of nesting pairs by nearby project construction. This statute does not provide for the issuance of any type of incidental take permit.

Section 1600 – Lake and Streambed Alteration

CDFW regulates activities that would interfere with the natural flow of, or substantially alter, a channel, bed, or bank of a lake, river, or stream. These activities are regulated under the California Fish and Game Code Sections 1600-1616. Under Section 1602, it is unlawful for any person, governmental agency, or public utility to do the following without first notifying CDFW: substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. Requirements to protect the integrity of biological resources and water quality are often conditions of streambed alteration agreements. Requirements may include avoidance or minimization of the use of heavy equipment, limitations on work periods to avoid impacts on wildlife and fisheries resources, and measures to restore degraded sites or compensate for permanent habitat losses. A Streambed Alteration Agreement may be required by CDFW for construction activities that could result in an accidental release into a jurisdictional area.

A stream is defined as a body of water that flows at least periodically or intermittently through a bed or channel that has banks and supports fish or other aquatic life. This definition includes watercourses with a surface or subsurface flow that supports or has supported riparian vegetation. CDFW's jurisdiction within altered or artificial waterways is based on the value of those waterways to fish and wildlife. A CDFW streambed alteration agreement must be obtained for any project that would result in an impact on a river, stream, or lake.

Unlike the federal government, California has adopted the Cowardin, et al. (1979) definition of wetlands. For purposes of this classification, wetlands must have one or more of the following three attributes: (1) at least periodically, the land supports predominantly hydrophytes (at least 50 percent of the aerial vegetative cover); (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year.

Under normal circumstances, the federal definition of wetlands requires all three wetland identification parameters to be met, whereas the Cowardin definition requires the presence of at least one of these parameters. For this reason, identification of wetlands by state agencies consists of the union of all areas that are periodically inundated or saturated, or in which at least seasonal dominance by hydrophytes may be documented, or in which hydric soils are present.

Both state and federal wetland laws require that the biological and hydrological functions, which are lost when a wetland or water is altered or filled, be replaced as part of the respective permit processes. Compensatory actions include replacement of lost wetland acreage, usually in amounts substantially greater than the amount lost.

Sections 3511, 4700, 5050 and 5515 – Fully Protected Species

Protection of fully protected species is described in Sections 3511, 4700, 5050, and 5515 of the California Fish and Game Code. These statutes prohibit take or possession of fully protected species. CDFW is unable to authorize incidental take of fully protected species when activities are proposed in areas inhabited by those species. CDFW has informed nonfederal agencies and private parties that they must avoid take of any fully protected species in carrying out projects.

Native Plant Protection Act

The Native Plant Protection Act includes measures to preserve, protect, and enhance rare and endangered native plants. The list of native plants afforded protection pursuant to the Native Plant Protection Act includes those listed as rare and endangered under the CESA. The Native Plant Protection Act provides limitations on take as follows: "No person will import into this State, or take, possess, or sell within this State" any rare or endangered native plant, except in compliance with provisions of the act. Individual landowners are required to notify the CDFW at least 10 days in advance of changing land uses to allow the CDFW to salvage any rare or endangered native plant material. Due to the absence of state-listed rare, threatened, or endangered plant species on the project site, the Native Plant Protection Act was not considered in this evaluation.

4.3 Local

Kern County General Plan

This regulatory framework identifies the federal, state, and local statutes, ordinances, or policies that govern the conservation and protection of biological resources that must be considered by the County during the decision-making process for projects that have the potential to affect biological resources. The Kern County General Plan includes the following goals related to biological resources:

1.10.5 Threatened and Endangered Species

Policies

Policy 27 Threatened or endangered plant and wildlife species should be protected in accordance with state and federal laws.

Policy 28 The County should work closely with state and federal agencies to assure that discretionary projects avoid or minimize impacts on fish, wildlife, and botanical resources.

Policy 29 The County will seek cooperative efforts with local, state, and federal agencies to protect listed threatened and endangered plant and wildlife species through the

use of conservation plans and other methods promoting management and conservation of habitat lands.

Policy 30 The County will promote public awareness of endangered species laws to help educate property owners and the development community of local, State, and federal programs concerning endangered species conservation issues.

Policy 31 Under the provisions of CEQA, the County, as lead agency, will solicit comments from the CDFG and the USFWS when an environmental document (Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report) is prepared.

Policy 32 Riparian areas will be managed in accordance with the USACE and the CDFG rules and regulations to enhance the drainage, flood control, biological, recreational, and other beneficial uses while acknowledging existing land use patterns.

Implementation Measures

Q. Discretionary projects shall consider effects to biological resources as required by the CEQA.

R. Consult and consider the comments from responsible and trustee wildlife agencies when reviewing a discretionary project subject to the CEQA.

S. Pursue the development and implementation of conservation programs with State and federal wildlife agencies for property owners desiring streamlined endangered species mitigation programs.

Bakersfield General Plan

The project site is also located within the area governed by the *Metropolitan Bakersfield General Plan* (City of Bakersfield and Kern County, 2002). Within the Conservation Element Biological Resources Section of the Bakersfield General Plan, there are goals, policies, and an implementation measure that are applicable to the Proposed Project:

- Goal 1: Conserve and enhance Bakersfield's biological resources in a manner which facilitates orderly development and reflect the sensitivities and constraints of these resources.
- Goal 2: To conserve and enhance habitat areas for designated "sensitive" animal and plant species.
- Policy 1: Direct development away from "sensitive biological resource" areas, unless effective mitigation can be implemented.
- Policy 2: Preserve areas of riparian vegetation and wildlife habitat within floodways and along rivers and streams, in accordance with the Kern River Plan Element and channel maintenance programs designed to maintain flood flow discharge capacity.
- Implementation 3: Preserve habitat and avoid "take" of protected species as required in the Metropolitan Bakersfield Habitat Conservation Plan.

Metropolitan Bakersfield Habitat Conservation Plan

The Metropolitan Bakersfield Habitat Conservation Plan (MBHCP) addresses the effect of urban growth on federally and State protected plant and animal species within the Metropolitan Bakersfield 2010 General Plan area. The MBHCP is a joint program of the City of Bakersfield and Kern County that was undertaken to assist urban development applicants in complying with State and federal endangered species laws. The MBHCP utilizes a mitigation fee paid by applicants for grading or building permits to fund the purchase and maintenance of habitat land to compensate for the effects of urban development on endangered species habitat. Half of the proposed project falls within the MBHCP area. However, the MBHCP finds that "commercial agricultural" activities are exempt from the requirements of the plan. Therefore, the proposed project would not be subject to MBHCP requirements.

5. Survey Results

This section describes results of a background and literature search, reconnaissance, and jurisdictional investigation conducted for the proposed project.

5.1 Sensitive Wildlife Species

This section describes the special-status wildlife species that are known, or have a medium to high potential to occur on or in the vicinity of the proposed project site, and the status of their presence based on field surveys and documented references as discussed in Table 1 above.

5.1.1 Reptiles

Blunt-Nosed Leopard Lizard

The blunt-nosed leopard lizard is a federally endangered and state endangered/fully protected species. It is endemic to the San Joaquin Valley of central California. This species typically inhabits open, sparsely vegetated areas of low relief on the San Joaquin Valley floor and in the surrounding foothills. Holland (1986) described the vegetative communities that blunt-nosed leopard lizards are most commonly found in as non-native grassland and Valley Sink Scrub communities. Other suitable habitat types on the Valley floor for this species include Valley Needlegrass Grassland (Holland 1986), Alkali Playa (Holland 1986), and Atriplex Grassland (USFWS 2010a).

The species is a relatively large lizard in the Iguanidae family with a long, regenerative tail; long, powerful hind limbs; and a short, blunt snout. Blunt-nosed leopard lizards use small rodent burrows for shelter from predators and temperature extremes. Burrows are usually abandoned ground squirrel tunnels, or occupied or abandoned kangaroo rat tunnels (*Dipodomys* spp.). Each lizard uses several burrows without preference, but will avoid those occupied by predators or other leopard lizards. In areas of low mammal burrow density, lizards would construct shallow, simple tunnels in earth berms or under rocks. Blunt-nosed leopard lizards feed primarily on insects (mostly grasshoppers, crickets, and moths) and other lizards, although some plant material is rarely eaten or, perhaps, unintentionally consumed with animal prey. They appear to feed

opportunistically on animals, eating whatever is available in the size range they can overcome and swallow (USFWS 2010a).

No blunt-nosed leopard lizards were observed on the project site during the 2012 reconnaissance. Suitable habitat does occur on the proposed project site within the non-native grassland and fallow agricultural fields, and many of the earthen berms along the access roads on the western property contain many small mammal burrows that could be utilized by the species; however, the habitat on the proposed project site is marginal at best and these areas are unlikely to support a population of the species. The saltbush scrub community in the vicinity of the proposed project provides higher quality habitat for the species. There is also one CNDDB occurrence record for the species within the vicinity of the proposed project (CDFG 2012a).

San Joaquin Whipsnake

The San Joaquin whipsnake is a California Species of Special Concern. The range of this species extends from west of Arbuckle in the Sacramento Valley southward to the Kern County portion of the San Joaquin Valley and westward into the inner South Coast Ranges.

San Joaquin whipsnake habitat includes open dry valley grassland with little or no tree cover and sandy or rocky soils. It occurs in open terrain and is most abundant in grassland, desert scrub, chaparral, and pasture habitats. They seek cover in rodent burrows, bushes, and rock piles, and hibernate in soil or sand approximately 0.3 meters below the surface. In the western San Joaquin Valley, the species occurs in valley grassland and saltbush scrub habitats. Whipsnakes are mainly terrestrial, but occasionally climb bushes to bask, seek prey and cover (Jennings and Hayes 1994).

Suitable habitat does occur on the proposed project site within the non-native grassland and fallow agricultural fields, and many of the earthen berms along the access roads on the Stockdale West property contain small mammal burrows that could be utilized by the species; however, the habitat on the proposed project site is marginal at best and these areas are unlikely to support a population of the species. The Saltbush Scrub community in the vicinity of the proposed project provides higher quality habitat for the species. There are 5 occurrences of the species in the vicinity of the proposed project site that are recorded to the CNDDB (CDFG 2012a).

5.1.2 Birds

Swainson's Hawk

The Swainson's hawk is a state threatened species and protected by the federal Migratory Bird Treaty Act. These birds sometimes travel in huge flocks and migrate from North America to Argentina but are monogamous and solitary nesters. They nest in strands with few trees in juniper-sage flats, riparian areas, and in oak savannahs. They require suitable adjacent foraging areas such as grasslands or alfalfa and grain fields which support rodent populations (PPA, 2006).

The species has been observed foraging in the vicinity of the proposed project during surveys conducted by ESA biologists for an unrelated project. The species is unlikely to nest in the

immediate vicinity of the proposed project site due to the lack of suitable nesting substrate; although two cottonwood trees exist on the proposed project site. No raptor nests were observed during the 2012 reconnaissance.

Burrowing Owl

Burrowing owl is a California Species of Special Concern. This small, ground-dwelling owl lives in ground squirrel and other mammal burrows that it appropriates and enlarges for its purposes. It typically is found in short-grass grasslands, open scrub habitats, and a variety of open, human-altered environments, such as golf courses, airport runways and agricultural fields. This owl is active at twilight, feeding on insects, amphibians, reptiles and small mammals. Burrowing owls have shown significant declines throughout California in recent years due principally to the conversion of grassland and pasturelands to agricultural and urban uses, and to poisoning programs to control California ground squirrels (CDFG 2012).

No focused burrowing owl surveys were conducted; however, the reconnaissance-level habitat assessment found that the project area contains suitable burrowing owl habitat within the non-native grassland, fallow agricultural field, the earthen berms that line the agricultural fields and access roads, and the adjacent Saltbush Scrub. Three burrowing owls were observed utilizing two separate burrows within the non-native grassland on the Stockdale West property during the reconnaissance. Many of the earthen berms along the access roads on the Stockdale West property also contain small mammal burrows that could be utilized by the species in the future.

Tricolored Blackbird

The tricolored blackbird prefers wetland and grassland habitats, although most native types of these habitats have been lost. Within the San Joaquin Valley, breeding colonies live mainly in the pasturelands, but can also be found in chaparral, orange and avocado groves, sagebrush grasslands, and salt-marsh habitat. Nesting takes place in native emergent marshes, grain fields, thickets of Himalayan blackberry, and other flooded and upland habitats (NatureServe 2012a).

No tricolored blackbirds were observed during the 2012 reconnaissance; however, the open water canals and agricultural fields on and near the proposed project site can support this species. Tricolored blackbirds were observed foraging in the region by ESA biologists during surveys conducted for an unrelated project. A CNDDB occurrence record for the species is located adjacent to the proposed project site.

5.1.3 Mammals

Nelson's Antelope Squirrel

Nelson's antelope squirrel is a state threatened species. It is a permanent resident of the western San Joaquin Valley from 60-360 meters in elevation on dry, sparsely vegetated, loam soils. It can be found from southern Merced County south to Kern, Kings, and Tulare Counties. The species also occurs in portions of eastern San Luis Obispo and Santa Barbara Counties. In 1979, only about 20% of the original range was occupied. Loss of habitat to cultivation and overgrazing, and

the effects of rodenticides have contributed to the decline of this species (Zeiner *et al.* 1988-1990).

Nelson's antelope squirrels feed primarily on insects, green vegetation, seeds, and occasionally on small vertebrates. These squirrels dig burrows, or use kangaroo rat burrows for cover and nesting. They also use cover provided by rocks, vegetation such as *Atriplex* spp. and *Ephedra* spp. and other topographic features. Suitable habitat has widely scattered alkali scrub vegetation and shrubs, annual forbs and grasses, and is distributed over broken terrain with small gullies and dry washes with sandy loam soils (Zeiner *et al.* 1988-1990).

No Nelson's antelope squirrels were observed during the 2012 survey. Suitable habitat for the species exists on the proposed project site within the non-native grassland and fallow agricultural fields, and many of the earthen berms along the access roads on the western property contain many small mammal burrows that could be utilized by the species; however, the habitat on the proposed project site is marginal at best and these areas are unlikely to support a population of the species. The Saltbush Scrub community in the vicinity of the proposed project provides a higher quality habitat for the species. Occurrence records for the species have also been recorded to the CNDDB within a mile of the proposed project site (CDFG 2012a).

Tipton Kangaroo Rat

The Tipton kangaroo rat is a California and federally listed endangered species. Tipton kangaroo rats eat mostly seeds, with small amounts of green, herbaceous vegetation and insects supplementing their diet when available. Burrow systems are usually in open areas but may occur in areas of thick scrub. Current occurrences are limited to scattered, isolated areas. In the southern San Joaquin Valley this includes the Kern National Wildlife Refuge, Delano, and other scattered areas within Kern County.

The Tipton kangaroo rat or kangaroo rat sign were not observed during the 2012 reconnaissance. Suitable habitat for the species exists on the proposed project site in the non-native grassland and fallow agricultural fields, and many of the earthen berms along the access roads on the Stockdale West property contain many small mammal burrows that could be utilized by the species; however, the habitat on the proposed project site is marginal at best and these areas are unlikely to support a population of the species. The Saltbush Scrub community in the vicinity of the proposed project provides higher quality habitat for the species. An occurrence record for the species is documented in the CNDDB within one mile of the proposed project site (CDFG 2012a).

San Joaquin Kit Fox

The San Joaquin kit fox is a state threatened and federally listed endangered species. They feed primarily on ground squirrels, kangaroo rats, desert cottontails, mice, insects, carrion and ground-nesting birds. Their habitat includes the San Joaquin Valley and Kern County area (USFWS 2010b).

A potential kit fox burrow was found in the canal wall just south of the Stockdale East property during the 2012 survey. The burrow occurs where the north-south road that bisects the property intersects the canal on the southern border just outside of the boundaries of the proposed project site. No kit fox sign was observed at or near the burrow. Only one entrance to the burrow was observed so the potential for the den to be used for pupping is low; however, due to the species' known presence in the region and the existence of suitable habitat in the immediate vicinity of the proposed project, there is a high probability that kit fox utilize the proposed project site.

American Badger

The American badger is a California Species of Special Concern. The range of the American badger includes most of the State, with the exception of the northwestern forests. Badgers occupy a variety of habitats, including grasslands, savannas, and mountain meadows where soils are suitable for digging for their preferred prey, large rodents such as ground squirrels, gophers, and kangaroo rats (NatureServe 2012b).

Ideal habitat for this species exists on the proposed project site and ESA biologists observed a potential active badger den in the immediate vicinity of the project site during surveys conducted for an unrelated project. No badgers, potential badger burrows or badger sign were observed during the 2012 reconnaissance.

5.2 Special-Status Plant Species

Precipitation for 2011-2012 was typical in the project region as well as throughout most of the State (NOAA 2012). Therefore, floristic representation at the time of the survey would have been typical for the month of July.

Based on the database search results (Table 2), special-status plant species known to occur in the vicinity of the project site included 16 annual species, three perennial herbaceous, bulbiferous, or stem succulent species, and one moss. Although none of the 16 annual special-status plant species identified in the database search would have likely been blooming during the July 2012 habitat assessment, all are considered to have a low potential for occurrence or are unlikely to occur on the proposed project site due to the lack of suitable habitat.

No special-status plant species were found within the proposed project site and none are expected to occur based on the database search and habitat assessment.

5.3 Jurisdictional Resources

The Stockdale East property abuts the Pioneer Canal on the southern boundary. The canal was dry during the reconnaissance. The canal consists of an unpaved channel comprised of dirt and sandy soils dominated by weedy plant species, such as Russian thistle. Its sandy berms provide habitat (breeding and foraging) for numerous local and migratory species of wildlife. Just south of the Pioneer Canal is the CVC; a paved canal with consistent, year-round water flow. There is also a small, shallow, vegetated recharge basin (0.5 acres) in the northwest corner of the Stockdale East property.

The Stockdale West property was recently converted from agricultural fields into water bank recharge basins planted with safflower. Raised access roads run between the basins with large culverts under each road to connect the basins. The culverts are reinforced with rip rap comprised of large rocks and boulders on both ends and around the road, allowing water to flow between the basins. Directly south of the western property is the Pioneer Canal and CVC, however a gap exists between the property and the canals that mostly consists of disturbed areas dominated by Russian thistle and non-native grassland.

The hydrophytic vegetation within the onsite canals and water features are being maintained only by a man-made source of water and hydrology. Should these sources of water (i.e., irrigation) be terminated, the vegetation would no longer exist and, therefore the areas are not be considered wetlands. The canals are man-made water supply conveyance facilities and thus are not considered WoUS or WoS. The shallow vegetated recharge basin on the Stockdale East property is used to store water for the adjacent agricultural fields. These three features are not under the jurisdiction of (or subject to regulation by) the USACE (per Section 404 of the CWA), the CDFW (per Section 1600 of the Fish and Game Code), or the RWQCB (per Section 401 of the CWA).

The CVC is the water source for the slough that exists south of the CVC on Strand Ranch. The slough consists of a canal and borrow pit. Historically, the canal has been used by neighboring KWBACB to convey water from the CVC to its recharge ponds east of Strand Ranch. Water conveyed through the canal to KWBA floods the slough. Although the riparian vegetation and conditions found in the slough meet the requirements of a wetland as defined by the USACE, there is no natural hydrological connection between the slough and any jurisdictional navigable waters, and therefore the slough is not a jurisdictional wetland. The proposed project would not impact the CVC, Pioneer Canal or slough. The proposed project would have no impact on riparian areas or wetlands.

6. Project Impacts and Mitigation Measures

Significance Criteria

A number of direct, indirect, and cumulative impacts to biological resources could occur as a result of implementation of the proposed project. Under the stipulations of CEQA, potential impacts to biological resources could be considered significant if actions associated with the proposed project:

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

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service.

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool,

coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

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

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

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

Construction Impacts

Impacts to biological resources would result primarily during habitat clearing, earth removal, grading, digging, and equipment movement. More mobile species like birds and larger mammals are expected to disperse into nearby habitat areas during construction. The use of access roads by construction/maintenance vehicles would result in accidental road-killed wildlife if these species occur on roads during construction activities. Vehicle collisions with San Joaquin kit fox, burrowing owl and other medium-large species may occur. Injury to or mortality of a special-status species during construction would be significant. However, implementation of the mitigation measures that are recommended below would reduce the potential for injury or mortality of special-status species during construction through monitoring and relocation of special-status species in the work area, worker environmental training, pre-construction sweeps for special-status wildlife, and covering all steep-walled excavations.

Operational Impacts

Vehicle and equipment travel on access roads during operation and maintenance may also disturb wildlife. Vehicles could cause direct mortality or injury to wildlife that are unable to move out of the way of vehicle traffic. As with construction, injury to or mortality of a special-status species during operations and maintenance would be significant. However, use of roads on the proposed project site during operations and maintenance would be of low volume, and speeds would be limited to 15 MPH. In addition, exterior lighting on the proposed project site will be kept to a minimum and nighttime vehicular traffic will be minimized.

6.1 Special-Status Species and Their Habitats

6.1.1 Wildlife

Reptiles

Based on the conditions at the proposed project site, CNDDB records, and the 2012 reconnaissance, no suitable habitat exists for the blunt-nosed leopard lizard and the San Joaquin whipsnake; impacts to the species is highly unlikely and no mitigation is required.

Birds

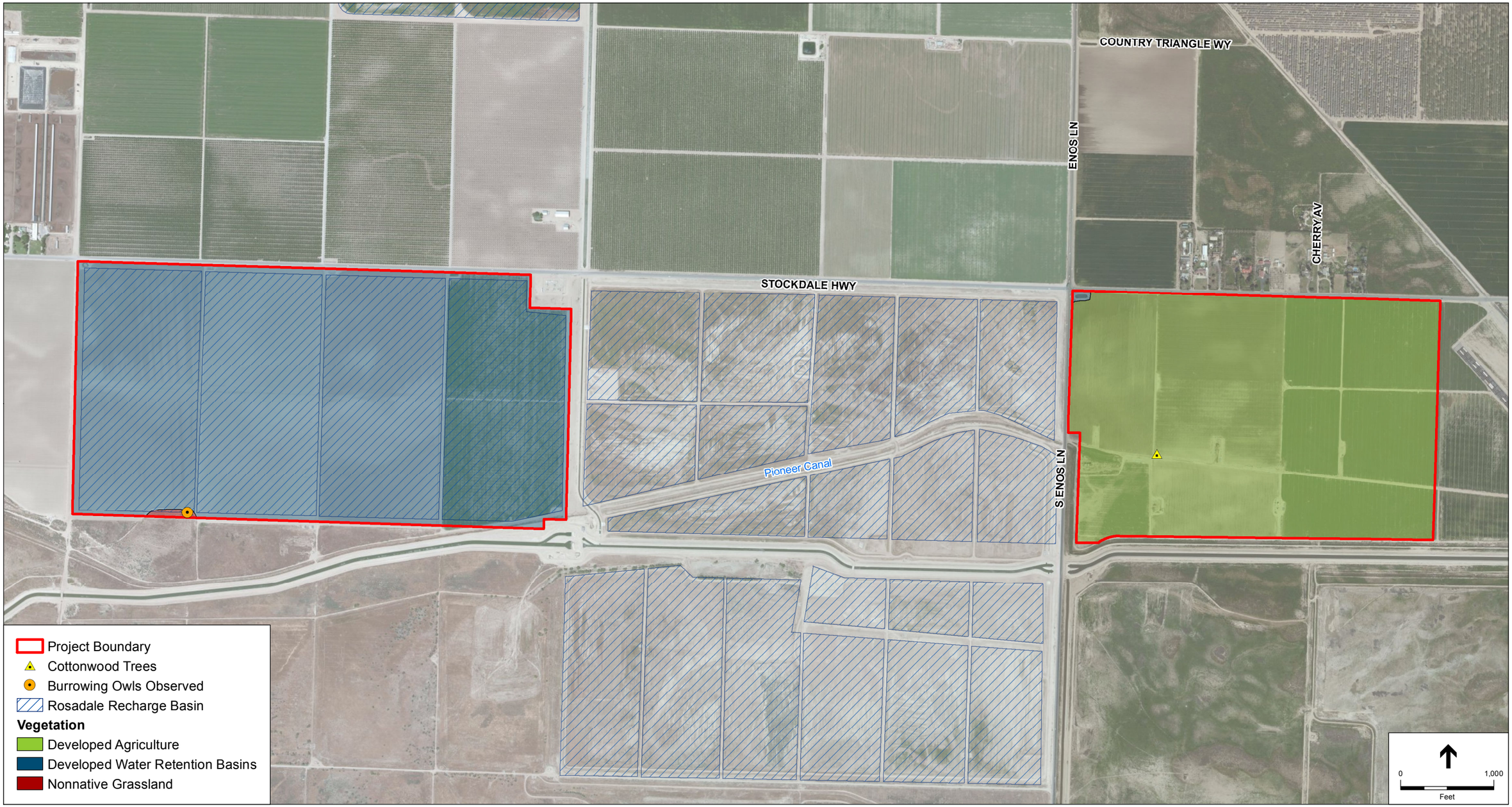
Activities associated with the construction of the proposed project could result in adverse impacts to migratory birds protected under the MBTA and special-status bird species, including Swainson's hawk, burrowing owl and tricolored blackbird.

Foraging Habitat: Swainson's hawks have been observed foraging in the vicinity of the proposed project. Implementation of the project would not impact foraging habitat of this species because a monoculture of safflower would be maintained, which would provide foraging habitat for the species.

Nesting Habitat: Direct impacts to migratory birds and special-status bird species would involve the removal/disturbance of the non-native grassland, fallow and active agricultural fields, and cottonwood trees, which have the potential to provide nesting opportunities for resident birds. Removal of nesting habitat during the breeding season could result in the direct mortality of birds. Tree removal, construction noise, vibrations, and human disturbance could cause nest abandonment, death of the young, or loss of reproductive potential at active nests located near proposed project activities. This would be a significant impact. Implementation of **MM-BIO-1, MM-BIO2, and MM-BIO-3** would reduce potential impacts to special-status nesting and migratory birds to a less than significant level.

Although no raptor nests were observed during the reconnaissance, the species may establish nests in suitable nesting habitat prior to construction, e.g., in the cottonwoods on the project site. The trees would also provide nesting opportunities for migratory birds. With implementation of **MM-BIO-1** through **MM-BIO-4**, any impacts to Swainson's hawk and other migratory bird nesting would be less than significant.

The proposed project could result in the displacement of burrowing owls. If burrowing owls nest on the proposed project site and these nesting birds are displaced by construction activities, this would be a significant impact. It is recommended that a Burrowing Owl Survey be conducted according to the Staff Report on Burrowing Owl Mitigation prepared by CDFG (2012). With implementation of **MM-BIO-1, MM-BIO-2** and **MM-BIO-5**, any impacts to the burrowing owl would be less than significant.



SOURCE: Bing Maps; Kern County GIS, 2012.

Stockdale Integrated Banking Project . 211181

Figure 5

Impacts to Vegetation Communities

This page left intentionally blank

Mitigation Measures

MM-BIO-1: A biological monitor with documented experience monitoring construction projects for the protection of biological resources shall be appointed by the implementing agency. The biological monitor will be the contact source for any employee or contractor who might inadvertently kill or injure a special-status species or who finds a dead, injured or entrapped species. The biological monitor shall be present during all phases of construction in sensitive habitats as described below for individual special-status species. The biological monitor must possess any required permits or certifications to recover and relocate special-status species as encountered during construction, including kit fox. If an injured or dead special-status species is encountered during construction, the on-call biological monitor has the authority to stop work within the immediate vicinity until the issue has been resolved. The on-call biological monitor shall notify the Kern County Planning Department and the appropriate resources agency (e.g., USFWS or CDFW) before construction is allowed to proceed.

MM-BIO-2: The implementing agency shall develop a Worker's Environmental Awareness Program (WEAP), which will consist of presenting the status, biology and protection measures associated the project to promote their awareness, and implementation measures if a species is encountered or impacted. The project proponent shall provide the WEAP training to all personnel working on the site during proposed project construction and operation. The program should include the following: A description of the species that may be affected by the project, including San Joaquin kit fox and its habitat needs; an explanation of the status of the species and its protection; and a list of measures being taken to reduce impacts to the species during proposed project construction and implementation. A fact sheet conveying this information should be prepared for distribution to the previously referenced people and anyone else who may enter the proposed project site.

MM-BIO-3: The following measures would reduce potential impacts to nesting and migratory birds and raptors to less than significant levels:

- Within 15 days of site clearing, a qualified biologist shall conduct a preconstruction, migratory bird and raptor nesting survey. The biologist must be qualified to determine the status and stage of nesting by migratory birds and all locally breeding raptor species without causing intrusive disturbance. This survey shall include species protected under the MBTA including the tricolored blackbird. The survey shall cover all reasonably potential nesting locations for the relevant species on or closely adjacent to the proposed project site.
- Nesting habitat should be removed prior to the bird breeding season (February 1).

  If an active nest is confirmed by the biologist and the habitat cannot be removed prior to the nesting season, no construction activities shall occur within at least 500 feet of the nesting site until the end of the breeding season (February 1 – September 30). An experienced ornithologist shall monitor the nest and 250-foot buffer until the nest has either failed or the birds have fledged.

MM-BIO-4: To assure that nesting Swainson's hawks are not disturbed by construction activities, a qualified ornithologist should conduct a pre-construction nesting survey within one-

half mile of the proposed project in areas with potentially suitable nesting habitat for Swainson's hawks. If a nest site is found, consultation with CDFW shall be required to ensure construction will not result in nest disturbance. No new disturbances or other project-related activities that may cause nest abandonment or forced fledging should be initiated within 0.5 mile of an active nest between 1 March and 15 September, or until 15 August if authorization is obtained for the proposed project from CDFW. These buffer zones may be adjusted as appropriate in consultation with a qualified ornithologist and CDFW. If construction or other proposed project-related activities that may cause nest abandonment by a Swainson's hawk or forced fledging occur, the work should be halted until the birds have fledged.

MM-BIO-5: A pre-construction survey shall be conducted for burrowing owls 14 to 30 days prior to clearing of the site by a qualified biologist in accordance with the most recent CDFW protocol, currently the Staff Report on Burrowing Owl Mitigation (CDFG 2012). Surveys shall cover suitable burrowing owl habitat disturbed by construction including a 500-foot buffer. The survey would identify adult and juvenile burrowing owls and signs of burrowing owl occupation. This survey shall include two early morning surveys and two evening surveys to ensure that all owl pairs have been located. If occupied burrowing owl habitat is detected on the proposed project site, measures to avoid, minimize, or mitigate impacts shall be incorporated into the proposed project and shall include the following:

- If owls are identified on or adjacent to the site, a qualified biologist shall provide a pre-construction WEAP to contractors and their employees that describes the life history and species protection measures that are in effect to avoid impacts to burrowing owls. Construction monitoring will also occur throughout the duration of construction activities to ensure no impacts occur to burrowing owl.
- Construction exclusion areas shall be established around the occupied burrows in which no disturbance shall be allowed to occur while the burrows are occupied. Buffer areas shall be determined based on the recommendations outlined in the most recent Staff Report on Burrowing Owl Mitigation (CDFG 2012).
- If occupied burrows cannot be avoided, methods for passive relocation and compensatory mitigation shall be incorporated into a Burrowing Owl Management Plan, subject to the approval of CDFW.

Significance After Mitigation*:* Less than significant.

Mammals

Activities associated with the construction of the proposed project could result in adverse impacts to San Joaquin kit fox.

Based on the conditions at the proposed project site, CNDDB records and the 2012 reconnaissance, no suitable habitat exists for the Nelson's Antelope squirrel and Tipton kangaroo rat. Therefore, no impact to these species is expected and no mitigation is required. While the site contains ideal habitat for badger, no sign was found; the species is highly mobile and therefore it is not likely that the species would be impacted. No mitigation is required.

There is a high probability that kit fox utilizes the project site as indicated by a kit fox burrow on the site. Any impact to this state threatened and federally endangered species would be significant. Implementation of **MM-BIO-1 and MM-BIO-2, and MM-BIO-6** and **MM-BIO-7** would reduce potential impacts to the San Joaquin kit fox to a less than significant level.

Mitigation Measures

MM-BIO-6: All steep-walled trenches or excavation pits more than two (2) feet deep shall be covered at the close of each working day by plywood or similar materials. Covers should be strong enough to prevent wildlife from falling through and should be designed to exclude small animals, including kit fox. The following measures shall be taken:

- If the trenches cannot be closed, one or more escape ramps constructed of earthen-fill or wooden planks shall be installed. Before such holes or trenches are filled, they should be thoroughly inspected for trapped animals.
- If at any time a trapped or injured kit fox is discovered, the USFWS and the CDFW shall be contacted as noted below.
- Open trenches, or other excavations that could entrap wildlife should be inspected by the biological monitor a minimum of three times per day and immediately before backfilling. If present, construction should not occur until the animal has left the trench or been removed by a qualified biological monitor as feasible.
- Employees and contractors should look under vehicles and equipment for the presence of wildlife before movement. If wildlife is observed, no vehicles or equipment should be moved until the animal has left voluntarily or is removed by the biological monitor.
- If the trenches or excavations cannot be covered, exclusion fencing constructed of materials that would exclude both large and small wildlife species should be installed around the trench or excavation to prevent entrapment of wildlife.

MM-BIO-7: The implementing agency shall conduct a USFWS-approved "early evaluation" of the proposed project to determine if a San Joaquin kit fox survey must be completed. If the evaluation shows that the San Joaquin kit fox does not utilize the proposed project site, then no further mitigation shall be required. If the "early evaluation" finds potential for the presence of kit fox, USFWS may require a take authorization/permit. The take authorization/permit may include measures specific to the needs of the proposed project in accordance with the USFWS Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance (USFWS 2011). These measures include:

- A 50-foot buffer will be implemented around any potential burrow. Placement of 4-5 flagged stakes 50 feet from the den entrance(s) will suffice to identify the den location; fencing will not be required, but the exclusion zone must be observed.
- Only essential vehicle operation on existing roads and foot traffic should be permitted. Otherwise, all construction, vehicle operation, material storage, or any other type of surface disturbing activity should be prohibited or greatly restricted within the exclusion zones. Proposed project-related vehicles should observe a daytime speed limit of 20-mph

throughout the site in all proposed project areas, except on county roads and State and Federal highways; this is particularly important at night when kit foxes are most active. Night-time construction should be minimized to the extent possible. However if it does occur, then the speed limit should be reduced to 10-mph. Off-road traffic outside of designated proposed project areas should be prohibited.

- Habitat subject to permanent and temporary construction disturbances and other types of ongoing proposed project-related disturbance activities should be minimized by adhering to the following activities. Proposed project designs should limit or cluster permanent proposed project features to the smallest area possible while still permitting achievement of proposed project goals. To minimize temporary disturbances, all proposed project-related vehicle traffic should be restricted to established roads, construction areas, and other designated areas. These areas should also be included in preconstruction surveys and, to the extent possible, should be established in locations disturbed by previous activities to prevent further impacts
- To prevent inadvertent entrapment of kit foxes or other animals during the construction phase of the proposed project, all excavated, steep-walled holes or trenches more than 2-feet deep should be covered as described in MM-BIO-6.
- Kit foxes are attracted to den-like structures such as pipes and may enter stored pipes and become trapped or injured. All construction pipes, culverts, or similar structures with a diameter of 4-inches or greater that are stored at a construction site for one or more overnight periods should be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a kit fox is discovered inside a pipe, then that section of pipe should not be moved until the USFWS has been consulted. If necessary, and under the direct supervision of the biologist, the pipe may be moved only once to remove it from the path of construction activity, until the fox has escaped.
- All food-related trash items such as wrappers, cans, bottles, and food scraps should be disposed of in securely closed containers and removed at least once a week from a construction or proposed project site.
- No firearms shall be allowed on the proposed project site.
- No pets, such as dogs or cats, should be permitted on the proposed project site to prevent harassment, mortality of kit foxes, or destruction of dens.
- Use of rodenticides and herbicides in proposed project areas should be restricted. This is necessary to prevent primary or secondary poisoning of kit foxes and the depletion of prey populations on which they depend. All uses of such compounds should 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, as well as additional proposed project-related restrictions deemed necessary by the USFWS. If rodent control must be conducted, zinc phosphide should be used because of a proven lower risk to kit fox.

- Any contractor, employee, or military or agency personnel who are responsible for inadvertently killing or injuring a San Joaquin kit fox shall immediately report the incident to the biological monitor. This biological monitor shall contact the CDFW immediately in the case of a dead, injured or entrapped kit fox. The CDFW contact for immediate assistance is State Dispatch at (916) 445-0045. They will contact the local warden or Mr. Paul Hoffman, the wildlife biologist, at (530) 934-9309. The USFWS should be contacted at the numbers below.
- The Sacramento USFWS and CDFW offices shall be notified in writing within three working days of the accidental death or injury to a San Joaquin kit fox during project related activities. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information.

  U.S. Fish and Wildlife Service
  Chief of the Division of Endangered Species
  Endangered Species Division
  2800 Cottage Way, Suite W2605
  Sacramento, California 95825-1846
  (916) 414-6620 or (916) 414-6600

  California Department of Fish and Wildlife
  Mr. Paul Hoffman
  1701 Nimbus Road, Suite A
  Rancho Cordova, California 95670
  (530) 934-9309.
- New sightings of kit fox shall be reported to the CNDDB. A copy of the reporting form and a topographic map clearly marked with the location of where the kit fox was observed should also be provided to the Service at the address below.

Significance After Mitigation: Less than significant

6.1.2 Plant Species

No special-status plant species are known to occur or could potentially occur in the study area. No impacts are expected and no mitigation is required.

6.2 Riparian Habitats and Natural Communities

No riparian habitats or sensitive natural communities were found within the proposed project site during the 2012 reconnaissance. No significant impacts would occur and no mitigation is required.

6.3 Protected Wetlands and Jurisdictional Resources

No WoUS, WoS, or any other additional jurisdictional riparian habitat occurs within the proposed project site, and none of the identified canals are anticipated to be impacted by project activities. No significant impacts would occur and no mitigation is required.

6.4 Habitat Linkages and Wildlife Movement Corridors

The Pioneer Canal and CVC to the south of the project areas provide opportunities for wildlife movement. In addition, the project area connects to an adjacent area of open space along the southern borders of the properties, and thus linkage value is deemed high quality; however, the project is not anticipated to affect the continued movement of any fish or wildlife species in this agriculture-dominated landscape. No mitigation is required.

6.5 Local Policies and Ordinances

Local policies or ordinances governing biological resources will not be affected and no mitigation is required.

6.6 Habitat Conservation Plans

The Stockdale East property will continue to be used for agricultural purposes approximately eight months of the year. Therefore, the proposed project is considered exempt from the stipulations contained within the MBHCP, which exempts "commercial agriculture." As a result of this exemption, no mitigation fee is required. However, the proposed project is therefore not covered by the 10(a) USFWS or the 2081 CDFW incidental take permits provided by the MBHCP for impacts to sensitive species.

7. Contributing Biologists

Greg Ainsworth, Project Director, Senior Biologist

- Technical report author

Dallas Pugh, Managing Associate Biologist

- Technical report author

Matthew South, Senior Associate Biologist

- Technical report author
- Biological constraints analysis and biological surveys

Christina Schaefer, Director of Biological Resources

- Senior review

8. References

California Department of Fish and Game (CDFG). 2007. *Fish and Game Code of California*.

CDFG. 2011. State of California Natural Resources Agency Department of Fish and Game Biogeographic Data Branch California Natural Diversity Database Special Animals List. January 2011. http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/spanimals.pdf Accessed: September 11, 2012.

CDFG. 2012a California Natural Diversity Database 3.1.0 Kern County and the following USGS 7.5-minute topographic quadrangles: Tupman, Buttonwillow, Rio Bravo, Rosedale, Stevens, Millux, Mouth of Kern, Taft, and East Elk Hills.

CDFG. 2012b. *Staff Report on Burrowing Owl Mitigation*. State of California Natural Resources Agency. March 7, 2012.

California Native Plant Society (CNPS). 2012. Inventory of Rare and Endangered Plants (online edition, v7-09b). California Native Plant Society. Sacramento, CA. Accessed on Tue, September 11, 2012 from http://www.cnps.org/inventory

Center for Biological Diversity. 2012. *Tricolored Blackbird Species Account: Natural History*. http://www.biologicaldiversity.org/species/birds/tricolored_blackbird/natural_history.html Website accessed September 12, 2012.

City of Bakersfield and Kern County. 2002. *Metropolitan Bakersfield General Plan Update EIR*, adopted June 26, 2002.

Code of Federal Regulations, as amended. Volume 33: Sections 325 through 328.

Environmental Science Associates (ESA). 2008. *Final Environmental Impact Report for the Strand Ranch Integrated Banking Project* . Prepared for Rosedale-Rio Bravo Water Storage District. May 2008.

Hickman, James C. ed. 1993. *The Jepson Manual*. University of California Press, Berkeley and Los Angeles, California.

Holland, Robert F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. California Department of Fish and Game, Natural Heritage Division, Sacramento, CA 1986.

Jameson, E.W. and Peeters, H.J. 2004. *Mammals of California*. University of California Press, Berkeley and Los Angeles, California.

Jennings, M. R., and M. P. Hayes. 1994. *Amphibian and reptiles species of special concern in California*. California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, California.

Jepson Flora Project, *Jepson Online Interchange*, http://ucjeps.berkeley.edu/interchange.html. Copyright@ Regents of the University of California, accessed September 9, 2012.

National Oceanic and Atmospheric Administration (NOAA). 2012. National Weather Service online records for precipitation December 2011 – July 2012: http://www.weather.gov/ (Accessed: September 13, 2012).

NatureServe. 2012a. NatureServe Explorer: An online encyclopedia of life [Tricolored blackbird]. Version 7.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: September 12, 2012)

NatureServe. 2012b. NatureServe Explorer: An online encyclopedia of life [American Badger]. Version 7.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: September 12, 2012)

Paul Pruett and Associates (PPA), Biota Report 628 Acres ±, Sec 2, T30S, R25E, MDBM SW Cor, Enos Lane and Stockdale Highway, Kern County, California, prepared for Alliance Appraisal Company, Bakersfield, California, 2003.

Paul Pruett and Associates (PPA), Biota Report 18+ Acres; 2,640 Feet Canal Turnout, Section 02, T30S, R25E, MDB&M, Bakersfield, California, prepared for Westmark Group, LLC, Bakersfield, California, October 2006.

Ram Environmental, 2009. *Phase I Environmental Site Assessment, APN#'S 160-010-39, and 42, Bakersfield, CA,* December 2009.

Sawyer, John O. and Keeler-Wolf, Todd. 2009. *A Manual of California Vegetation, 2nd Edition.* California Native Plant Society. United Sates of America.

Sibley, D. 2003. *The Sibley Field Guide to Birds of Western North America*. Alfred A. Knopf, New York.

Stebbens, Robert. 1985. *Western Reptiles and Amphibians.* Houghton Mifflin Company, New York.

U.S. Army Corps of Engineers 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)

U.S. Department of Agriculture (USDA), National Resources Conservation Service (NRCS), 2012. *Web Soil Survey*, data request for IRWD Stockdale West Joint Banking Project site, web application available at: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx , accessed July 2012.

U.S. Fish and Wildlife Service (USFWS) and CDFG. 1996. Survey Protocol for the Morro Bay Kangaroo Rat: www.dfg.ca.gov/hcpb/species/stds_gdl/survmonitr.shtml. Accessed on September 12, 2012.

United States Fish and Wildlife Service (USFWS). 2010a. *Blunt-nosed leopard lizard (*Gambelia sila*) 5-Year Review: Summary and Evaluation*. February 2010.

USFWS. 2010b. *San Joaquin Kit Fox (*Vulpes macrotis mutica*) 5-Year Review: Summary and Evaluation*. February 16, 2010.

USFWS. 2011. *Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance*. Prepared by the Sacramento Fish and Wildlife Office. January 2011.

USFWS. 2012a. Federal Endangered and Threatened Species that may be Affected by Projects in Kern County.

USFWS. 2012b. *United States Fish and Wildlife Service National Wetlands Inventory online wetlands mapper*. http://www.fws.gov/wetlands/Data/Mapper.html. Last updated: September 6, 2012. Accessed September 11, 2012.

Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White, eds. 1988-1990. California's Wildlife. Vol. I-III. California Department of Fish and Game, Sacramento, California.

Appendix D-2

Kit Fox Minimization Measures

San Joaquin Kit Fox Minimization Measures

Prior to construction, a qualified biological monitor shall implement the following measures:

1. Prior to construction, project plans shall clearly delineate that: *"Speeds signs of 25 mph maximum (or lower) shall be posted for all construction traffic, to minimize the probability of road mortality of the San Joaquin kit fox."* Speed limit signs shall be installed on the project site within 30 days prior to initiation of site disturbance and/or construction,

2. Within 30 days prior to initiation of site disturbance and/or construction, all personnel associated with the project shall attend a worker education training program, conducted by a qualified biologist, to avoid or reduce impacts on sensitive biological resources (i.e. San Joaquin kit fox). At a minimum, as the program relates to the kit fox, the training shall include the kit fox's life history, all mitigation measures specified by the District, as well as any related biological report(s) prepared for the project.

In accordance with the training provided by the qualified biological monitor, the construction contractor shall implement the following measures:

- During the site disturbance and/or construction phase, grading and construction activities after dusk shall be prohibited.

- During the site-disturbance and/or construction phase, to prevent entrapment of the San Joaquin kit fox, all excavation, steep-walled holes or trenches in excess of two feet in depth shall be covered at the close of each working day by plywood or similar materials, or provided with one or more escape ramps constructed of earth fill or wooden planks. Trenches shall also be inspected for entrapped kit fox each morning prior to onset of field activities and immediately prior to covering with plywood at the end of each working day. Before such holes or trenches are filled, they shall be thoroughly inspected for entrapped kit fox. Any kit fox so discovered shall be allowed to escape before field activities resume, or removed from the trench or hole by a qualified biologist and allowed to escape unimpeded.

- During the site-disturbance and/or construction phase, any pipes, culverts, or similar structures with a diameter of four inches or greater, stored overnight at the project site shall be thoroughly inspected for trapped San Joaquin kit foxes before the subject pipe is subsequently buried, capped, or otherwise used or moved in any way. If during the construction phase a kit fox is discovered inside a pipe, that section of pipe will not be moved, or if necessary, be moved only once to remove it from the path of activity, until the kit fox has escaped.

- During the site-disturbance and/or construction phase, all food-related trash items such as wrappers, cans, bottles, and food scraps generated shall be disposed of in closed containers only and regularly removed from the site. Food items may attract San Joaquin kit foxes onto the project site, consequently exposing such animals to increased risk of injury or mortality. No deliberate feeding of wildlife shall be allowed.

- Prior to, during, and after the site-disturbance and/or construction phase, use of pesticides or herbicides shall be in compliance with all local, state and federal regulations. This is necessary to minimize the probability of primary or secondary poisoning of endangered species utilizing adjacent habitats, and the depletion of prey upon which San Joaquin kit foxes depend.

Exhibit C: San Joaquin Kit Fox Minimization Measures (con't)

- During the site-disturbance and/or construction phase, any contractor or employee that inadvertently kills or injures a San Joaquin kit fox or who finds any such animal either dead, injured, or entrapped shall be required to report the incident immediately to the applicant and District. In the event that any observations are made of injured or dead kit fox, the applicant shall immediately notify the U.S. Fish and Wildlife Service and the Department by telephone (see contact information below). In addition, formal notification shall be provided in writing within three working days of the finding of any such animal(s). Notification shall include the date, time, location and circumstances of the incident. Any threatened or endangered species found dead or injured shall be turned over immediately to the Department for care, analysis, or disposition.

- Prior to final inspection, should any long internal or perimeter fencing be proposed or installed, the applicant shall do the following to provide for kit fox passage:

  a. If a wire strand/pole design is used, the lowest strand shall be no closer to the ground than 12".
  b. If a more solid wire mesh fence is used, 8" x 12" openings near the ground shall be provided every 100 yards.

  Upon fence installation, the applicant shall notify the County to verify proper installation. Any fencing constructed after issuance of a final permit shall follow the above guidelines.

Contact Information

California Department of Fish and Game
1234 East Shaw Avenue
Fresno, CA 93710
(559) 243-4014
(559) 243-4020

U.S. Fish and Wildlife Service
Ventura Field Office
2493 Portola Road, Suite B
Ventura, CA 93003
(805) 644-1766

Appendix E

Analysis of Potential Groundwater Level Changes from Recharge and Recovery at the Stockdale West and Stockdale East Facilities

Rosedale-Rio Bravo Water Storage District
Irvine Ranch Water District

January 23, 2015

Proposed Stockdale Integrated Banking Project – Analysis of Potential Groundwater Level Changes from Recharge and Recovery at the Stockdale West and Stockdale East Facilities

Thomas Harder & Co.
Groundwater Consulting

IRVINE RANCH WATER DISTRICT

Rosedale-Rio Bravo WATER STORAGE DISTRICT

Proposed Stockdale Integrated Banking Project – Analysis of Potential Groundwater Level Changes from Recharge and Recovery at the Stockdale West and Stockdale East Facilities

1/23/2015

Prepared for

Rosedale-Rio Bravo Water Storage District
and
Irvine Ranch Water District

Prepared by

Thomas Harder
Principal Hydrogeologist

Thomas Harder & Co.
Groundwater Consulting

PROFESSIONAL GEOLOGIST • STATE OF CALIFORNIA • THOMAS E. HARDER No: 6512

CERTIFIED HYDROGEOLOGIST • STATE OF CALIFORNIA • THOMAS E. HARDER No: 588

Table of Contents

1 Introduction 1
1.1 Purpose and Scope 1
1.2 Sources of Data 1
1.3 Analysis Methodology 2
2 Evaluation of Annual Recharge Capacity at the Sites 3
3 Evaluation of Aquifer Storage Capacity at the Sites 4
4 Groundwater Quality Evaluation 6
5 Potential Well Pumping Rates and Conceptual Well Design 7
5.1 Potential Well Pumping Rates in the Project Area 7
5.2 Typical Well Designs for Existing Wells in the Project Area 7
5.3 Conceptual Well Design and Preliminary Discharge Rate for Proposed Stockdale Integrated Banking Project Wells 7
6 Evaluation of Potential Well Sites 8
7 Description of the Kern Fan Area Model 9
7.1 Model Code 9
7.2 Model Area and Grid Geometry 9
7.3 Model Layers 9
7.4 Sources of Recharge and Discharge 10
7.5 Model Calibration 10
8 Project Scenarios for Analysis Using the Groundwater Flow Model 11
8.1 Baseline Groundwater Level Condition 11
8.2 Project Scenarios 12
8.2.1 Scenario 1 – Recharge During High Groundwater Conditions 12
8.2.2 Scenario 2 – Pumping During Low Groundwater Conditions 12
8.2.3 Scenario 3 – Pumping During Historical Low Groundwater Conditions 13
9 Analysis of Potential Groundwater Level Changes 14
9.1 Scenario 1 - Groundwater Recharge during High Baseline Conditions 14
9.2 Scenario 2 - Groundwater Pumping during Low Groundwater Conditions 14
9.3 Scenario 3 - Groundwater Pumping during Historical Low Groundwater Conditions .. 15

10 Findings and Conclusions 17

11 References..... 19

Tables

1 Proposed Stockdale Integrated Banking Project – Annual Recharge Capacity Estimates

2 Proposed Stockdale Integrated Banking Project - Aquifer Storage Capacity Estimates

3 Proposed Stockdale Integrated Banking Project - Summary of Selected Groundwater Quality Data

4 Proposed Stockdale Integrated Banking Project - One-Year Groundwater Recovery Analysis

5 Proposed Stockdale Integrated Banking Project - Model Scenario Summary

6 Summary of Maximum Model-Predicted Groundwater Level Change

Figures

1 Regional Map

2 Project Area

3 Proposed Project Production Well Locations

4 Instantaneous Pumping Rates in Stockdale East and West Area

5 Specific Capacities in the Stockdale East and West Area

6 Kern Fan Model Calibration

7 Hydrographs for Wells 30S/25E-04J and 30S/25E-06L

8 Scenario 1 Model-Predicted Groundwater Mounding Relative to the Cross Valley Canal – Shallow/Intermediate Aquifers

9 Scenario 1 Model-Predicted Groundwater Recharge Mounding Relative to Baseline – Shallow/Intermediate Aquifers

10 Scenario 1 Model-Predicted Groundwater Recharge Mounding Relative to Baseline – Deep Aquifer

11 Model-Predicted Groundwater Level Change Over Time - Scenario 1, Shallow/Intermediate Aquifers – Groundwater Recharge

12 Model-Predicted Groundwater Level Change Over Time - Scenario 1, Deep Aquifer Groundwater Recharge
13 Scenario 1 Baseline Groundwater Elevation Contour Maps - Maximum Mounding Intermediate Aquifer
14 Scenario 1 Baseline Groundwater Elevation Contour Maps - Maximum Mounding Deep Aquifer
15 Scenario 2 Model-Predicted Pumping Drawdown Relative to Baseline Shallow/Intermediate Aquifers
16 Scenario 2 Model-Predicted Pumping Drawdown Relative to Baseline – Deep Aquifer
17 Scenario 2 Maximum Predicted Pumping Drawdown at Nearest Production Wells Deep Aquifer
18 Scenario 2 Maximum Predicted Pumping Drawdown at Nearest Private Wells – Deep Aquifer
19 Model-Predicted Groundwater Level Change Over Time - Scenario 2 - Groundwater Pumping during Low Groundwater Conditions – Shallow/Intermediate Aquifers
20 Model-Predicted Groundwater Level Change Over Time - Scenario 2 - Groundwater Pumping during Low Groundwater Conditions – Deep Aquifer
21 Scenario 2 Groundwater Elevation Contour Maps – Intermediate Aquifer
22 Scenario 2 Groundwater Elevation Contour Maps – Deep Aquifer
23 Scenario 3 Model-Predicted Pumping Drawdown Relative to Baseline – Shallow/Intermediate Aquifers
24 Scenario 3 Model-Predicted Pumping Drawdown Relative to Baseline – Deep Aquifer
25 Scenario 3 Maximum Predicted Pumping Drawdown at Nearest Production Wells – Deep Aquifer
26 Scenario 3 Maximum Predicted Pumping Drawdown at Nearest Private Wells – Deep Aquifer
27 Model-Predicted Groundwater Level Change Over Time - Scenario 3 - Pumping during Historical Low Groundwater Conditions – Shallow/Intermediate Aquifers

28 Model-Predicted Groundwater Level Change Over Time - Scenario 3 - Groundwater Pumping during Historical Low Groundwater Conditions – Deep Aquifer
29 Scenario 3 Groundwater Elevation Contour Maps – Intermediate Aquifer
30 Scenario 3 Groundwater Elevation Contour Maps – Deep Aquifer

Appendix

Groundwater Quality Laboratory Report

1 Introduction

This report summarizes an analysis of potential groundwater level changes from proposed artificial recharge and recovery operations at the Proposed Stockdale Integrated Banking Project (the Project), located west of Bakersfield, California (see Figure 1). The proposed Project includes two facilities: The Stockdale West property in the northern half of T30SR25E Section 3 and the Stockdale East property in the northern half of T30SR25E Section 1 (see Figure 2). The Project will be operated by the Rosedale-Rio Bravo Water Storage District (RRBWSD) in cooperation with the Irvine Ranch Water District (IRWD).

1.1 Purpose and Scope

The purpose of the analysis presented herein is to:

1. Estimate the annual recharge capacity of the proposed Project facilities.
2. Estimate the storage capacity of the aquifer system directly beneath the Project facilities.
3. Identify the number and location of extraction wells for the Project.
4. Evaluate potential changes in groundwater levels associated with recharge and recovery at the facilities.
5. Determine if predicted groundwater level changes result in potential adverse impacts.

The scope of work to address the objectives included:

1. Compiling and reviewing hydrogeological data for the immediate Project area.
2. Developing estimates of recharge capacity and aquifer storage capacity for the facilities.
3. Identifying the number, location, and conceptual construction of new wells for use in analysis of groundwater level impacts.
4. Developing recharge and recovery scenarios for analysis.
5. Analyzing the scenarios using a calibrated groundwater flow model.
6. Evaluating potential groundwater level changes from model results.

1.2 Sources of Data

The calibrated groundwater flow model used in the analysis of groundwater level changes incorporates a comprehensive hydrogeological database of the Project Area (TH&Co, 2011). The types of data used to develop the model included geology, soils/lithology, hydrogeology, surface water hydrology, climate, crop types/land use, topography, remote sensing and groundwater recharge and pumping.

The groundwater flow model has been updated with data specific to the Project Area. These data include:

- Strand Ranch and Stockdale West Infiltration Test Data from August 2011 and January 2012 (RRBWSD, 2012a)
- Strand Ranch Surface Water Deliveries (RRBWSD, 2012b)
- Lithology, pumping test data, groundwater levels, and groundwater quality from Strand Ranch Well Completion Reports (Wildermuth Environmental, 2010a-d and 2011a-e)
- Groundwater level data from Strand Ranch observation wells (Wildermuth Environmental, 2012c)

In addition, a number of reports and documents were reviewed as a basis for interpreting the analysis. These included:

- Strand Ranch Integrated Banking Project Environmental Impact Report (ESA, 2008)
- Draft Strand Ranch Groundwater Quality Summary and Blending Analysis (Wildermuth Environmental, 2012a)
- Draft Estimation of Aquifer System Properties and Characterization of Recharge Mounding at the Strand Ranch Water Bank (Wildermuth Environmental, 2012b)
- Determination of Aquifer Storage Capacity for the Rosedale-Rio Bravo Water Storage District (Sierra Scientific Services, 2003)

A comprehensive reference list is provided in Section 10.

1.3 Analysis Methodology

Potential groundwater level changes associated with Stockdale West and Stockdale East recharge and recovery operations were evaluated using a three-dimensional, numerical groundwater flow model previously developed for a large portion of the Kern River Fan area west of Bakersfield, California (TH&Co, 2011). The Project Area boundaries are completely within the model area (see Figure 1). A more detailed description of the model is provided in Section 6.

2 Evaluation of Annual Recharge Capacity at the Sites

For this analysis, annual recharge capacity is defined as the maximum volume of water that each Project facility can infiltrate into the subsurface in a year (see Table 1). The recharge capacity was estimated based on the size of the facilities (wetted area), the time available to accept water (assumed to be 365 days), and the infiltration rate. For Stockdale West, the wetted area is estimated to be 265 acres based on design drawings of the basins as provided by IRWD. For Stockdale East, the wetted area is estimated to be 186 acres, which is 80 percent of the total area of the property.

Infiltration rates for the Stockdale West and Stockdale East facilities were estimated based on recharge operations data for the adjacent Strand Ranch Integrated Banking Project Facility. In calendar year 2011, a total of 37,638 acre-ft of water was delivered to the Strand Ranch Integrated Banking Project recharge basins (17,500 acre-ft for IRWD and 20,138 acre-ft for RRBWSD). In many of the months, the basins were filled to capacity. The lowest infiltration rate necessary to accommodate the delivered water during months when the basin capacity (including surface storage) was maximized was 0.28 ft/day. This infiltration rate was used as a basis for estimating the recharge capacity at the Stockdale West and Stockdale East facilities. This infiltration rate is consistent with infiltration rates observed at other recharge basins in the area (TH&Co, 2011).

Using the infiltration rate estimated from 2011 Strand Ranch Integrated Banking Project operations and the wetted areas for the facilities, as described above, the potential annual recharge estimates for Stockdale West and Stockdale East are approximately 27,100 acre-ft/yr and 19,000 acre-ft/yr, respectively (see Table 1).

3 Evaluation of Aquifer Storage Capacity at the Sites

The aquifer storage capacity was estimated as the volume of groundwater that can be stored in the aquifer directly beneath the facilities. The aquifer storage capacity was estimated by multiplying the total aquifer volume beneath the sites by the specific yield of the aquifer sediments:

$$A_s = V \times S_y$$

where:

A_s = Aquifer storage capacity (acre-ft)

V = Total aquifer volume (acre-ft)

S_y = Specific yield of aquifer sediments (dimensionless)

The total aquifer volume is a function of the surface area of the sites, the depth of useable aquifer, and a minimum groundwater depth (see Table 2). The aquifer storage capacity estimates assume that only the aquifer directly beneath the sites is available for storage. Thus, the surface area of the Stockdale West and Stockdale East Sites multiplied by the useable aquifer thickness define the total aquifer volume. The useable aquifer thickness at Stockdale East is estimated to extend from 10 feet below ground surface (ft bgs) to 667 ft bgs. At Stockdale West, the useable aquifer thickness is estimated to extend from 14 ft bgs to 684 ft bgs. The top depth corresponds to the approximate invert depth of the Cross Valley Canal (CVC) at its closest location to each of the respective Sites. The bottom depth corresponds to the deepest useable aquifer, as determined from drilling and testing at the adjacent Strand Ranch Integrated Banking Project property (Wildermuth Environmental, 2011e).

Specific yield is the ratio between the volume of water the aquifer will release from storage due to gravity drainage to the total volume of aquifer. A specific yield of 0.14 was used for the shallow and intermediate aquifer system beneath the sites, based on pumping test data from a well on the adjacent Strand Ranch Integrated Banking Project property that was perforated in these aquifers (Wildermuth Environmental, 2010d). A specific yield of 0.10 was used for the deep aquifer based on the lithologic characteristics of the sediments from borehole logs near the Project (TH&Co, 2011).

Using the above methodology, the total storage capacity for the Stockdale West site is approximately 26,000 acre-ft and the total storage capacity for the Stockdale East site is approximately 18,400 acre-ft (see Table 2).

The methodology used herein to estimate aquifer storage capacity has been applied elsewhere in the area of the Kern Water Bank although assumptions for the useable aquifer thickness vary. The Kern Water Bank Authority (KWBA) has indicated they have 1.5 million acre-ft of readily accessible aquifer storage in their service area, which covers 20,000 acres (KWBA, 2012). Assuming a specific yield range of 0.10 to 0.14, the KWBA storage estimate requires a useable aquifer thickness between 535 ft and 750 ft, which is consistent with the aquifer thickness assumed for this analysis (approximately 675 ft).

4 Groundwater Quality Evaluation

As a preliminary evaluation of the groundwater quality at the Stockdale West and Stockdale East sites, TH&Co collected groundwater samples from two existing agricultural wells for analysis of a full suite of drinking water quality analytes (i.e. Title 22 suite). One agricultural well is located in the southeast portion of Stockdale West and one well is located in the south central portion of Stockdale East (see Figure 3). Although the exact depths and perforation intervals of the wells are not known, it is assumed that they are perforated similar to other agricultural wells in the area (200 ft to 700 ft bgs). Both wells are equipped with pumps and were in operation supplying irrigation water at the time of sampling.

TH&Co collected groundwater samples from sampling ports on the discharge lines for the two agricultural wells on 29-Aug-12. All water quality samples were transferred to properly labeled laboratory prepared sample containers and temporarily stored in sample coolers with ice. All samples were delivered to Fruit Grower's Laboratory (FGL) under chain-of-custody protocol on the same day collected.

Results of the groundwater quality analyses are summarized in Table 3. Laboratory reports are provided in Appendix A. The total dissolved solids (TDS) concentration measured in the samples ranged from 280 milligrams per liter (mg/L) in Stockdale East well to 400 mg/L in the Stockdale West well. Nitrate (as NO_3^-) was detected at concentrations ranging from 13.4 mg/L (Stockdale West) to 14.4 mg/L (Stockdale East). Arsenic was not detected.

Gross alpha was the only constituent detected above its maximum contaminant level (MCL). This constituent was detected in the sample from Stockdale West at 18.9 picocuries per liter (pCi/L) and in the sample from Stockdale East at 15 pCi/L. The MCL for this constituent is 15 pCi/L. Of the total gross alpha, uranium accounted for approximately 10 to 11 pCi/L. However, the uranium concentration did not exceed its MCL of 20 pCi/L.

It is noted that perchloroethene (PCE) and trichloroethene (TCE) were detected in the sample from Stockdale East and ethylene dibromide (EDB) was detected in the sample from Stockdale West. However, all concentrations were well below their respective MCLs (see Appendix A).

5 Potential Well Pumping Rates and Conceptual Well Design

5.1 Potential Well Pumping Rates in the Project Area

As a basis for determining the number and location of potential production wells for placement and analysis in the groundwater flow model, it was necessary to assess potential individual pumping rates for new wells. Pumping tests on recently constructed production wells on the adjacent Strand Ranch Integrated Banking Project property show instantaneous discharge rates ranging from approximately 2,300 gallons per minute (gpm) to 2,500 gpm (see Figure 4). The discharge rate for RRBWSD's Enns Well No. 3, located approximately 0.5-mile north of Stockdale West, is approximately 3,000 gpm (Zeiders Consulting, 2010).

5.2 Typical Well Designs for Existing Wells in the Project Area

Existing wells in the Project vicinity include Strand Ranch Integrated Banking Project wells, Kern Water Bank (KWB) wells, and private agricultural and domestic wells (see Figures 3 and 5). Recently constructed Strand Ranch Integrated Banking Project wells SREX-1 through SREX-5 and SREX-7 are perforated from approximately 380 ft to 660 ft bgs, which is the deeper portion of the aquifer (see Figure 4). Strand Ranch Integrated Banking Project well Strand No. 6 (SREX-6) is an older agricultural well that is being used for the project. This well is perforated from 195 to 390 ft bgs, which is typical of other private agricultural wells in the area (see Figure 5). KWB wells are typically perforated from approximately 200 ft to 700 ft bgs and include both the intermediate and shallow portions of the aquifer system.

5.3 Conceptual Well Design and Preliminary Discharge Rate for Proposed Stockdale Integrated Banking Project Wells

Although depth-specific groundwater quality testing is recommended to determine final production well design, for preliminary design and purposes of this analysis, it was assumed that production wells at Stockdale West and Stockdale East would be perforated from approximately 250 ft bgs to 650 ft bgs. Based on the analysis of potential discharge rates from existing wells and in consideration of the conceptual well design, it is assumed for this analysis that each new Stockdale West and Stockdale East well will have an instantaneous discharge rate of 2,800 gpm.

6 Evaluation of Potential Well Sites

The number of production wells identified for the Project was determined based on anticipated Project operations. For estimating the annual production capacity of each well, it was assumed that each well would pump at a rate of 2,800 gpm for a period of 10 months per year, which is the most likely annual operating extraction duration. This results in a maximum annual production of approximately 3,750 acre-ft/well (see Table 4). Thus, for Stockdale West, three wells are included that are capable of extracting up to approximately 11,250 acre-ft/yr. For Stockdale East, two wells are included that are capable of extracting up to 7,500 acre-ft/yr.

Project pumping wells assumed in the analysis are shown on Figure 3. Criteria for siting the wells included:

- Location as far from existing private and production wells as possible.
- Location at least 880 ft from the non-Strand Ranch Integrated Banking Project property boundaries.
- Spacing of at least 1,250 ft from each other.

7 Description of the Kern Fan Area Model

Potential groundwater level changes associated with Stockdale West and Stockdale East recharge and recovery operations were evaluated using a three-dimensional numerical groundwater flow model previously developed for the Kern Water Bank area west of Bakersfield, California (TH&Co, 2011).

7.1 Model Code

The numerical groundwater flow model code selected for use in this evaluation was MODFLOW. MODFLOW is a block centered, finite difference groundwater flow modeling code developed by the USGS for simulating groundwater flow (McDonald and Harbaugh, 1988). MODFLOW is one of the most widely used and critically accepted model codes available (Anderson and Woessner, 2002). In order to address the extreme hydraulic head changes observed in the historical groundwater level record and the conceptualization of layers that would become dry, TH&Co utilized a specialized version of MODFLOW called MODFLOW SURFACT (HydroGeoLogic, Inc., 2001). This model code includes a more robust numerical and matrix solution scheme that is necessary to address desaturation and resaturation of model layers and pumping from wells perforated across multiple layers.

7.2 Model Area and Grid Geometry

The Model Domain is approximately 15.8 miles long, 10.2 miles wide (approximately 161 square miles) and is orientated 20 degrees counter-clockwise from horizontal (roughly parallel to the Kern River). The model domain has been discretized into 417 columns and 268 rows with 200 ft by 200 ft cells. There are a total of 335,268 cells in the three layer model.

7.3 Model Layers

Three model layers were developed from the conceptualization of the aquifer system based on an analysis of the geology and hydrogeology of the model area. Layer 1 represents the shallow aquifer and generally includes the upper 100 to 150 ft of alluvial sediments. This layer is modeled as unconfined. Layer 2 represents the intermediate aquifer and is generally 250 to 350 ft thick. Layer 2 includes the upper screened intervals of many production wells. During periods of full saturation, this layer is modeled as semi-confined. During periods when groundwater levels drop below the top of the layer, it becomes unconfined. Layer 3 represents the deep aquifer and includes the 600 ft of aquifer below Layer 2. It is generally characterized by less permeable sediments than Layer 2 and is always confined.

7.4 Sources of Recharge and Discharge

Groundwater recharge and discharge were applied to the model in monthly stress periods for the period between October 1988 and December 2013. Recharge was applied to the uppermost active model layer within 113 individual recharge areas (i.e. defined recharge zones in the model). Recharge zones were assigned to each basin for the Kern Water Bank located adjacent and south of the Project. Recharge basins for other area projects were treated as individual recharge zones or grouped, depending on their size and availability of data. Various reaches of the Kern River were also modeled as recharge zones. Other recharge in the model includes septic system return flow, municipal and industrial return flow, agricultural return flow and canal losses.

Sources of groundwater discharge in the model include underflow out of the model, groundwater pumping, and evapotranspiration applied to surface water in channels and spreading basins. Monthly groundwater pumping was incorporated into the model from 259 municipal and project wells and 194 agricultural wells. Municipal and project pumping data was obtained from metered production records from the various agencies. Agricultural pumping was estimated based on land use data and crop demand estimates.

7.5 Model Calibration

The TH&Co (2014) Kern Fan Area groundwater flow model was calibrated using the history matching technique whereby model-generated groundwater levels are compared to measured groundwater levels in monitoring wells within the model area. The calibration is based on an acceptable match of 12,307 groundwater levels measured in 18 target monitoring wells[1] between October 1988 and December 2013. A common measure of the acceptability of model calibration is the normalized root mean squared (RMS) of the model residuals. A calibration residual is the difference between the model-generated groundwater level and the observed groundwater level. The RMS is normalized by dividing by the observed head range in the model. The normalized RMS is expressed as a percent with results less than 10 percent considered a reasonable model calibration. The groundwater flow model developed for this analysis was calibrated with a normalized RMS of 8.3 percent (see Figure 6).

[1] It is noted that many of the 18 target wells are "nested" monitoring wells with multiple depth-specific perforation intervals at each location.

8 Project Scenarios for Analysis Using the Groundwater Flow Model

The Stockdale West and Stockdale East sites will function as water recharge and recovery facilities. During periods when surface water is available for artificial recharge, water will be delivered to the facilities for infiltration and storage underground. During periods when RRBWSD or IRWD needs the stored water, it will be pumped out and delivered accordingly. The maximum volume of surface water stored underground and subsequently recovered will be limited to the aquifer storage capacity estimates from Section 3 and loss factors that apply to all recharge and recovery projects in the Kern Fan Area consistent with the Pioneer Project Participation Agreement (MOU) dated 27-Apr-98 (KCWA, 1998).

For this analysis, monthly artificial recharge and groundwater production associated with the Project was superimposed on a portion of the historical groundwater record that represents the range of potential groundwater level conditions that could be expected in the future. Significant changes in groundwater levels have occurred during the various recharge and recovery cycles in the Project area since 1995 when the Kern Water Bank and Pioneer Project began operations (see Figure 7). The most extreme changes occurred between 2004 and 2010 when groundwater levels fluctuated as much as 246 ft from an historical high level in 2007 to an historical low level in 2010. For Model simulations, this period of extreme groundwater level fluctuations was selected as the conditions upon which to superimpose Stockdale West and Stockdale East recharge and recovery in order to simulate the greatest potential cumulative impact with respect to groundwater levels at existing wells and CVC.

8.1 Baseline Groundwater Level Condition

The impact of Stockdale West and Stockdale East recharge and recovery scenarios was evaluated relative to a baseline groundwater level condition for the period from 2004 through 2010. The baseline condition includes all historical hydrological conditions, including recharge and recovery from other area banking projects (e.g. KWB, Pioneer Project, RRBWSD etc.), which resulted in the calibrated groundwater levels in the flow model. In addition, hypothetical maximum recharge and recovery operations from the Enns Pond and Strand Ranch Integrated Banking Project were incorporated into the model between 2004 and 2010 and are reflected in the groundwater level baseline (see Figure 7). A total of 51,300 acre-ft of Strand Ranch Integrated Banking Project recharge was simulated between January 2005 and January 2006. A total of 21,880 acre-ft of groundwater pumping was simulated for the Strand Ranch Integrated Banking Project facility for each of the 10-month periods of February 2004 through November 2004 and September 2009 through June 2010. A total of 5,060 acre-ft of Enns Pond groundwater pumping was simulated for each of the same 10-month periods. Enns Pond and Strand Ranch Integrated Banking Project recharge and recovery was simulated in the baseline to coincide with the hydrologic conditions under which this project is likely to operate. Proposed

Stockdale West and Stockdale East operations were simulated to coincide with likely Enns Pond and Strand Ranch Integrated Project operations during extreme hydrological conditions in order to provide a conservative impact evaluation.

8.2 Project Scenarios

Project-related groundwater recharge and pumping was superimposed on the Baseline condition in accordance with the Project scenarios summarized in Table 5. The purpose of the scenarios was to enable evaluation of potential Project-related groundwater level changes under a full range of groundwater level conditions. Groundwater recharge was simulated under 2005 to 2006 high recharge conditions (Scenario 1). Groundwater recovery was simulated under low groundwater conditions as was observed from 2004 to 2005 (Scenario 2) and historical low groundwater conditions as was observed from 2009 to 2010 (Scenario 3).

Groundwater level changes associated with the Project were evaluated with respect to existing surface and groundwater facilities in the area. For recharge during high groundwater conditions, model-predicted groundwater levels are compared to the invert elevation of the CVC. For pumping scenarios, model-predicted groundwater level changes were evaluated relative to the historical range of groundwater levels that have previously been observed in the area. Groundwater level changes were evaluated with respect to the shallow/intermediate aquifers (model Layers 1 and 2) and the deep aquifer system beneath the site (model Layer 3).

8.2.1 Scenario 1 – Recharge During High Groundwater Conditions

Scenario 1 was developed to assess potential groundwater level impacts associated with proposed Project recharge. For this scenario, Project recharge was introduced into the model between January 2005 and January 2006, which represents high groundwater conditions in the area (see Figure 7). Recharge was introduced into the Stockdale West and Stockdale East area simultaneously at a rate adequate to fill each facility's respective aquifer storage capacity while accounting for losses. Thus, the simulated recharge volume (see Table 5), is nine percent higher than the estimated storage capacity (see Table 2) to account for losses in accordance with the MOU. This rate of recharge is realistic based on infiltration rates estimated for the facilities (see Table 1).

8.2.2 Scenario 2 – Pumping During Low Groundwater Conditions

Scenario 2 was developed to assess potential groundwater level impacts associated with proposed Project pumping. For Scenario 2, pumping was simulated during a 10-month period between February 2004 and November 2004, which represents low groundwater conditions. Project pumping includes the simultaneous extraction of 11,250 acre-ft of groundwater from

three wells at Stockdale West and 7,500 acre-ft of groundwater from two wells at Stockdale East during the 10-month period (see Table 4). This extraction scenario is representative of how the Project is anticipated to be operated.

8.2.3 Scenario 3 – Pumping During Historical Low Groundwater Conditions

Scenario 3 was developed to assess potential groundwater level impacts associated with proposed Project pumping during historical low groundwater levels. For Scenario 3, pumping was simulated during a 10-month period between September 2009 and June 2010, which represents historical low groundwater conditions. Project pumping includes the simultaneous extraction of 11,250 acre-ft of groundwater from three wells at Stockdale West and 7,500 acre-ft of groundwater from two wells at Stockdale East during the 10-month period. This extraction scenario is representative of how the Project is anticipated to be operated.

9 Analysis of Potential Groundwater Level Changes

9.1 Scenario 1 - Groundwater Recharge during High Baseline Conditions

Analysis of Scenario 1 model simulation results shows a maximum groundwater mound, relative to the hydrologic baseline, of approximately 35 ft directly beneath Stockdale West and approximately 29 ft directly beneath Stockdale East (see Figure 8; Table 6). Model results show that groundwater levels are predicted to rise as much as 4 ft above the bottom of the CVC canal near the Stockdale West site under Scenario 1 recharge conditions (i.e. high groundwater conditions; see Figure 8). Groundwater levels are not predicted to rise within 10 ft of the bottom of the CVC canal near the Stockdale East site. The maximum mounding occurs in the shallow and intermediate aquifers (model Layers 1 and 2) with lesser mounding predicted in the deep aquifer (model Layer 3; see Figure 10).

Groundwater levels directly beneath the basins are predicted to decline relatively rapidly following a period of recharge (Figures 11 and 12). Groundwater levels in the shallow and intermediate aquifers (model Layers 1 and 2) decline to within 10 ft of their pre-recharge levels within one year after recharge is stopped (Figure 11). Groundwater levels in the deep aquifer (model Layer 3) decline to within 6 ft of the pre-recharge level within one year (Figure 12).

Groundwater recharge at the Stockdale West and Stockdale East facilities is not predicted to result in significant changes in the groundwater flow direction in the Project area. As shown on Figure 13, shallow and intermediate (model Layer 2) groundwater under baseline conditions flows to the northwest beneath Stockdale West and to the Northeast beneath Stockdale East. Although Scenario 1 groundwater contours show higher elevations beneath the facilities, the direction of groundwater flow is similar. Similarly, the groundwater flow direction for Scenario 1 was not observed to change significantly in the deeper aquifer (model Layer 3) relative to the Baseline (see Figure 14).

9.2 Scenario 2 - Groundwater Pumping during Low Groundwater Conditions

Analysis of Scenario 2 model simulation results shows maximum pumping drawdown, relative to the hydrologic baseline, is predicted to range from approximately 18 ft in the shallow/intermediate aquifer directly beneath Stockdale East (see Figure 15) to approximately 34 ft in the deep aquifer directly beneath Stockdale West (see Figure 16). Maximum pumping interference (i.e. Project-related drawdown) at the nearest existing production well (Kern Water Bank Well 6D03) is predicted to be approximately 27 ft and occurs in model Layer 3 (see Figure 17). Maximum pumping interference at the nearest existing private well to Stockdale West is predicted to be approximately 18 ft in the shallow/intermediate aquifer (model Layer 2) and 28 ft in the deeper aquifer (model Layer 3; see Figure 18). Maximum pumping interference

at the nearest existing private well to Stockdale East is predicted to be approximately 14 ft in the shallow/intermediate aquifer (model Layer 2) and 20 ft in the deeper aquifer (model Layer 3).

Groundwater level drawdown is predicted to recover relatively rapidly following a period of pumping (Figures 19 and 20). Groundwater levels in the shallow and intermediate aquifers (model Layers 1 and 2) recover to within 5 ft of their pre-recharge levels within six months after pumping is stopped (Figure 19). Groundwater levels in the deep aquifer (model Layer 3) recover to within 5 ft of the pre-recharge level within three months after pumping is stopped (Figure 20).

Groundwater pumping at the Stockdale West and Stockdale East facilities during low groundwater conditions is not predicted to result in significant changes in the groundwater flow direction in the Project area. As shown on Figure 21, groundwater in the shallow and intermediate aquifers, under baseline conditions, flows to the northwest beneath the Projects. Although Scenario 2 groundwater contours show localized pumping depressions beneath the facilities, the regional direction of groundwater flow is similar to the baseline. Similarly, the groundwater flow direction for Scenario 2 was not observed to change significantly in the deeper aquifer (model Layer 3) relative to the Baseline (see Figure 22).

9.3 Scenario 3 - Groundwater Pumping during Historical Low Groundwater Conditions

Analysis of Scenario 3 model simulation results shows maximum pumping drawdown, relative to the hydrologic baseline, is predicted to range from approximately 27 ft in the shallow/intermediate aquifer directly beneath Stockdale East (see Figure 23) to approximately 34 ft in the deep aquifer directly beneath Stockdale West (see Figure 24). Maximum pumping interference at the nearest existing production well (Kern Water Bank Well 6D03) is predicted to be approximately 28 ft and occurs in model Layer 3 (see Figure 25). Maximum pumping interference at the nearest existing private well to Stockdale West is predicted to be approximately 21 ft in the shallow/intermediate aquifer (model Layer 2) and 29 ft in the deeper aquifer (model Layer 3; see Figure 26 and Table 6). Maximum pumping interference at the nearest existing private well to Stockdale East is predicted to be approximately 16 ft in the shallow/intermediate aquifer (model Layer 2) and 21 ft in the deeper aquifer (model Layer 3).

Groundwater level drawdown in Scenario 3 is predicted to recover relatively rapidly following a period of pumping (Figures 27 and 28). Groundwater levels in the shallow and intermediate aquifers (model Layers 1 and 2) recover to within 8 ft of their pre-recharge levels within six months after pumping is stopped (Figure 27). Groundwater levels in the deep aquifer (model Layer 3) recover to within 5 ft of the pre-recharge level within three months after pumping is stopped (Figure 28).

Groundwater pumping at the Stockdale West and Stockdale East facilities under historical low groundwater conditions (2009 to 2010) is predicted to expand slightly the regional pumping depression that already existed south of the Project (see Figure 29). As shown on Figure 29, groundwater in the shallow and intermediate aquifers in the Project area, under baseline conditions, flowed to the south toward the Kern Water Bank. Although Scenario 3 groundwater contours show a slight expansion of this pumping depression beneath the facilities, the regional direction of groundwater flow is similar to the baseline (to the south). Similarly, the regional pumping depression and associated groundwater flow directions observed in the deeper aquifer for the Scenario 3 baseline was not observed to change significantly as a result of Stockdale West and Stockdale East pumping (see Figure 30).

10 Findings and Conclusions

The following summarizes the findings and conclusions that have been developed based on the analysis of Stockdale West and Stockdale East recharge and recovery scenarios:

Stockdale West

- Based on infiltration rates estimated from recharge operational data at the adjacent Strand Ranch Integrated Banking Project facility, Stockdale West can accommodate up to approximately 27,100 acre-ft of recharge in a year.
- The storage capacity of the aquifer system directly beneath the Stockdale West Site is estimated to be approximately 26,000 acre-ft.
- With the exception of gross alpha, the groundwater quality at the Stockdale West site meets all Title 22 drinking water criteria. Gross alpha concentrations are not significantly over the MCL and can be addressed through blending, as has been shown for the Strand Ranch Integrated Banking Project (Wildermuth, 2012a).
- Anticipated Project extraction operations will require at least three production wells, assuming each is pumped at a rate of 2,800 gpm for 10 months per year, in order to meet the goals of the Project.

Stockdale East

- Based on infiltration rates estimated from recharge operational data at the adjacent Strand Ranch Integrated Banking Project facility, Stockdale East can accommodate up to approximately 19,000 acre-ft of recharge in a year.
- The storage capacity of the aquifer system directly beneath the Stockdale East Site is estimated to be approximately 18,400 acre-ft.
- With the exception of gross alpha, the groundwater quality at the Stockdale East site meets all Title 22 drinking water criteria. Gross alpha concentrations are not significantly over the MCL and can be addressed through blending, as has been shown for the Strand Ranch Integrated Banking Project (Wildermuth, 2012a).
- Anticipated Project extraction operations will require at least two production wells, assuming each is pumped at a rate of 2,800 gpm for 10 months per year, in order to meet the goals of the Project.

Groundwater Level Changes Predicted for the Combined Stockdale West and Stockdale East Project

- Artificial recharge, as simulated in Scenario 1 for high groundwater conditions, is predicted to result in groundwater levels as much as 4 ft above the invert elevation of the CVC near the Project at Stockdale West. As such, recharge during high groundwater conditions should be managed in accordance with a groundwater monitoring and mitigation plan to avoid impacts to the CVC.
- Groundwater pumping during low groundwater conditions, as simulated in Scenario 2, is predicted to result in a maximum of approximately 27 ft of interference at the nearest production well (deep aquifer; see Table 6).
- Project-related groundwater drawdown in private wells that are perforated only in the shallow and intermediate aquifers near Stockdale West would be less than the drawdown in wells perforated in the deep aquifer or multiple aquifers.
- As most of the private wells near the Project are perforated in the shallow/intermediate aquifer, simulated Project pumping interference in the closest private well (near Stockdale West) is predicted to range from 18 ft (low groundwater conditions; Scenario 2) to 21 ft (historical low groundwater conditions; Scenario 3).
- Under normal conditions, maximum groundwater pumping interference predicted as a result of the proposed Project (up to 27 ft in the nearest production wells) is well within the historical fluctuation in groundwater levels previously observed (up to 246 ft; see Figure 7) and should not adversely impact the normal operation of existing wells. However, the Project should be managed in accordance with a groundwater monitoring and mitigation plan to avoid adverse impacts to existing wells.
- With the exception of localized pumping depressions in the immediate vicinity of the Stockdale West and Stockdale East facilities, the regional groundwater flow direction is not predicted to change significantly as a result of recharge or recovery associated with the Project.

11 References

Anderson, M.P, and Woessner, W.W., 2002. *Applied Groundwater Modeling, Simulation of Flow and Advective Transport*. Academic Press.

ESA, 2008. Final Environmental Impact Report – Strand Ranch Integrated Banking Project. May 2008.

Hill, Mary C., and Tiedeman, Claire R., 2007. Effective Groundwater Model Calibration, with Analysis of Data, Sensitivities, Predictions, and Uncertainty. Wiley-Interscience, New Jersey.

HydroGeoLogic, Inc., 2001. MODFLOW-SURFACT.

KCWA, 1983. Report on Investigation of Optimization and Enhancement of the Water Supplies of Kern County. Prepared by Associated Engineering Consultants, January 1983.

KCWA, 1998. Pioneer Project Participation Agreement. Dated April 27, 1998.

KWBA, 2012. www.kwba.org/index Accessed on August 8, 2012.

McDonald, M.G., and Harbaugh, A.W., 1988. *A Modular Three-Dimensional Finite-Difference Ground-Water Flow Model:* in Techniques of Water-Resources Investigations of the United States Geological Survey; Book 6 Modeling Techniques.

RRBWSD, 2012a. Unpublished Pond Infiltration Test Data. August and January, 2012.

RRBWSD, 2012b. Unpublished Surface Water Deliveries to the Strand Ranch and Stockdale West Properties. 2010 and 2011.

Sierra Scientific Services, 2003. Determination of Aquifer Storage Capacity for the Rosedale-Rio Bravo Water Storage District. January 20, 2003.

TH&Co., 2011. Hydrogeological Impact Evaluation Related to Operation of the Kern Water Bank and Pioneer Projects. Prepared for Rosedale-Rio Bravo Water Storage District, December 5, 2011.

TH&Co., 2014. Groundwater Flow Model, unpublished update.

Wildermuth Environmental, 2010a. Drilling, Construction, Development and Testing – SROW-1, Strand Ranch Water Banking Facility, Kern County, California. Report prepared for Irvine Ranch Water District, March, 2010.

Wildermuth Environmental, 2010b. Drilling, Construction, Development and Testing – SROW-3, Strand Ranch Water Banking Facility, Kern County, California. Report prepared for Irvine Ranch Water District, March, 2010.

Wildermuth Environmental, 2010c. Drilling, Construction, Development and Testing – SROW-4, Strand Ranch Water Banking Facility, Kern County, California. Report prepared for Irvine Ranch Water District, March, 2010.

Wildermuth Environmental, 2010d. Drilling, Construction, Development and Testing - SREX-1, Strand Ranch Water Banking Facility, Kern County, California. Report prepared for Irvine Ranch Water District, June, 2010.

Wildermuth Environmental, 2011a. Drilling, Construction, Development and Testing - SREX-2, Strand Ranch Water Banking Facility, Kern County, California. Report prepared for Irvine Ranch Water District, August, 2011.

Wildermuth Environmental, 2011b. Drilling, Construction, Development and Testing - SREX-3, Strand Ranch Water Banking Facility, Kern County, California. Report prepared for Irvine Ranch Water District, August, 2011.

Wildermuth Environmental, 2011c. Drilling, Construction, Development and Testing - SREX-4, Strand Ranch Water Banking Facility, Kern County, California. Report prepared for Irvine Ranch Water District, August, 2011.

Wildermuth Environmental, 2011d. Drilling, Construction, Development and Testing - SREX-5, Strand Ranch Water Banking Facility, Kern County, California. Report prepared for Irvine Ranch Water District, August, 2011.

Wildermuth Environmental, 2011e. Drilling, Construction, Development and Testing - SREX-7, Strand Ranch Water Banking Facility, Kern County, California. Report prepared for Irvine Ranch Water District, August, 2011.

Wildermuth Environmental, 2012a. Draft Strand Ranch Groundwater Quality Summary and Blending Analysis. Letter report prepared for Irvine Ranch Water District, July 17, 2012.

Wildermuth Environmental, 2012b. Draft Estimation of Aquifer System Properties and Characterization of Recharge Mounding at the Strand Ranch Water Bank. Letter report prepared for Irvine Ranch Water District, August 7, 2012.

Wildermuth Environmental, 2012c. Historical Groundwater Levels in Strand Ranch Observation Wells. Accessed from HydroDaVE August, 2012.

Zeiders Consulting, 2010. Unpublished well data for the Enns Pond Wells.

Tables

Proposed Stockdale Integrated Banking Project
Estimated Annual Recharge Capacity

	Stockdale West	Stockdale East
Total Basin Size (acres)	265	186[1]
Estimated Infiltration Rate (ft/day)	0.28	0.28
Monthly Recharge Capacity (acre-ft/month)[2]	2,300	1,600
Annual Recharge Capacity (acre-ft/yr)	27,100	19,000

Notes:

[1]Estimated as 80% of the property.
[2]acre-ft = acre-feet.

Proposed Stockdale Integrated Banking Project
Aquifer Storage Capacity Estimates

	Stockdale West	Stockdale East
Property Size (acres)	323	232
Shallow Subsurface Stockdale East (10-100 ft bgs[1]) Stockdale West (14-100 ft bgs)	86	90
Intermediate Subsurface (100-350 ft bgs)	250	250
Deep Subsurface Stockdale East (350-667 ft bgs) Stockdale West (350-684 ft bgs)	334	317
Shallow Subsurface Specific Yield[2]	0.14	0.14
Intermediate Subsurface Specific Yield	0.14	0.14
Deep Subsurface Specific Yield	0.10	0.10
Shallow Subsurface Storage Capacity (acre-ft)[3]	3,900	2,900
Intermediate Subsurface Storage Capacity (acre-ft)	11,300	8,100
Deep Subsurface Storage Capacity (acre-ft)	10,800	7,400
Total Storage Capacity (acre-ft)	**26,000**	**18,400**

Notes:

[1]bgs = below ground surface.

[2]Specific yield values from Wildermuth (2011) pumping test data and TH&Co (2012) calibrated groundwater flow model.

[3]acre-ft = acre-feet.

Proposed Stockdale Integrated Banking Project
Summary of Selected Groundwater Quality Data

Analyte	Stockdale West Analysis Result	Stockdale East Analysis Result	Units	Drinking Water Standards / MCL[1]
TDS[2]	400	280	mg/L[3]	500
Nitrate (as NO_3^-)	13.4	14.4	mg/L	45
Arsenic	ND[4]	ND	µg/L[5]	10
Chloride	81	51	mg/L	500
Gross α	18.9 ± 3.01	15.0 ± 2.54	pCi/L[6]	15
Uranium	10.2 ± 1.89	10.9 ± 1.95	pCi/L	20

Notes:

[1] MCL = Maximum Contaminant Level.
[2] TDS = Total Dissolved Solids.
[3] mg/L = Milligrams per liter.
[4] ND = Not detected above the detection limit of 2 µg/L.
[5] µg/L = Micrograms per liter.
[6] pCi/L = Picocuries per liter.

Proposed Stockdale Integrated Banking Project
One-Year Groundwater Recovery Analysis

	Total Storage Capacity (acre-ft)[1]	Instantaneous Production Rate (gpm)[2]	Annual Production Capacity Per Well[3] (acre-ft)	Prorated One-Year Production Goal (acre-ft)	Number of Wells Needed
Stockdale West	26,000	2,800	3,750	11,250	3
Stockdale East	18,400	2,800	3,750	7,500	2

Notes:

[1]acre-ft = acre-feet.

[2]gpm = gallons per minute.

[3]Assumes 10 months of extraction per year at an average discharge rate of 2,800 gpm/well.

Proposed Stockdale Integrated Banking Project
Model Scenario Summary

Scenario	Project Phase	Facility	Recharge/Recovery Rate (acre-ft/yr)[1]	Groundwater Level Conditions	Simulated Period of Recharge/Recovery
1	Recharge	Stockdale East	20,100	2005 (High)	Jan 2005 to Jan 2006
		Stockdale West	28,340		
2	Recovery	Stockdale East	7,500	2004 (Low)	Feb 2004 to Nov 2004
		Stockdale West	11,250		
3	Recovery	Stockdale East	7,500	2009 - 2010 (Historical Low)	Sept 2009 to June 2010
		Stockdale West	11,250		

Note:

[1] Recharge rates for Stockdale East and Stockdale West are equivalent to the aquifer storage capacity plus 9 percent to account for losses.

Summary of Maximum Model-Predicted Groundwater Level Change

Scenario	Project	Point of Reference Location	Maximum Change in Groundwater Level (ft)	
			Shallow and Intermediate Aquifer	Deep Aquifer
Scenario 1 (Recharge)	Stockdale West	Basin Center	34.9	6.9
		CVC[1]	29.7	7.0
	Stockdale East	Basin Center	28.9	9.0
		CVC	24.2	9.0
	Strand Ranch	Basin Center	20.7	7.9
Scenario 2 (Pumping during Low Groundwater Conditions)	Stockdale West	Basin Center	-23.9	-33.5
		Nearest Production Well	-16.7	-26.9
		Nearest Private Well	-17.5	-28.0
	Stockdale East	Basin Center	-18.4	-24.3
		Nearest Production Well	-10.8	-16.6
		Nearest Private Well	-13.5	-19.6
	Strand Ranch	Basin Center	-12.6	-21.5
Scenario 3 (Pumping during Historical Low Groundwater Conditions)	Stockdale West	Basin Center	-31.3	-34.4
		Nearest Production Well	-21.4	-27.7
		Nearest Private Well	-20.7	-28.7
	Stockdale East	Basin Center	-27.2	-25.9
		Nearest Production Well	-15.3	-17.8
		Nearest Private Well	-15.7	-20.5
	Strand Ranch	Basin Center	-15.2	-22.6

Note:

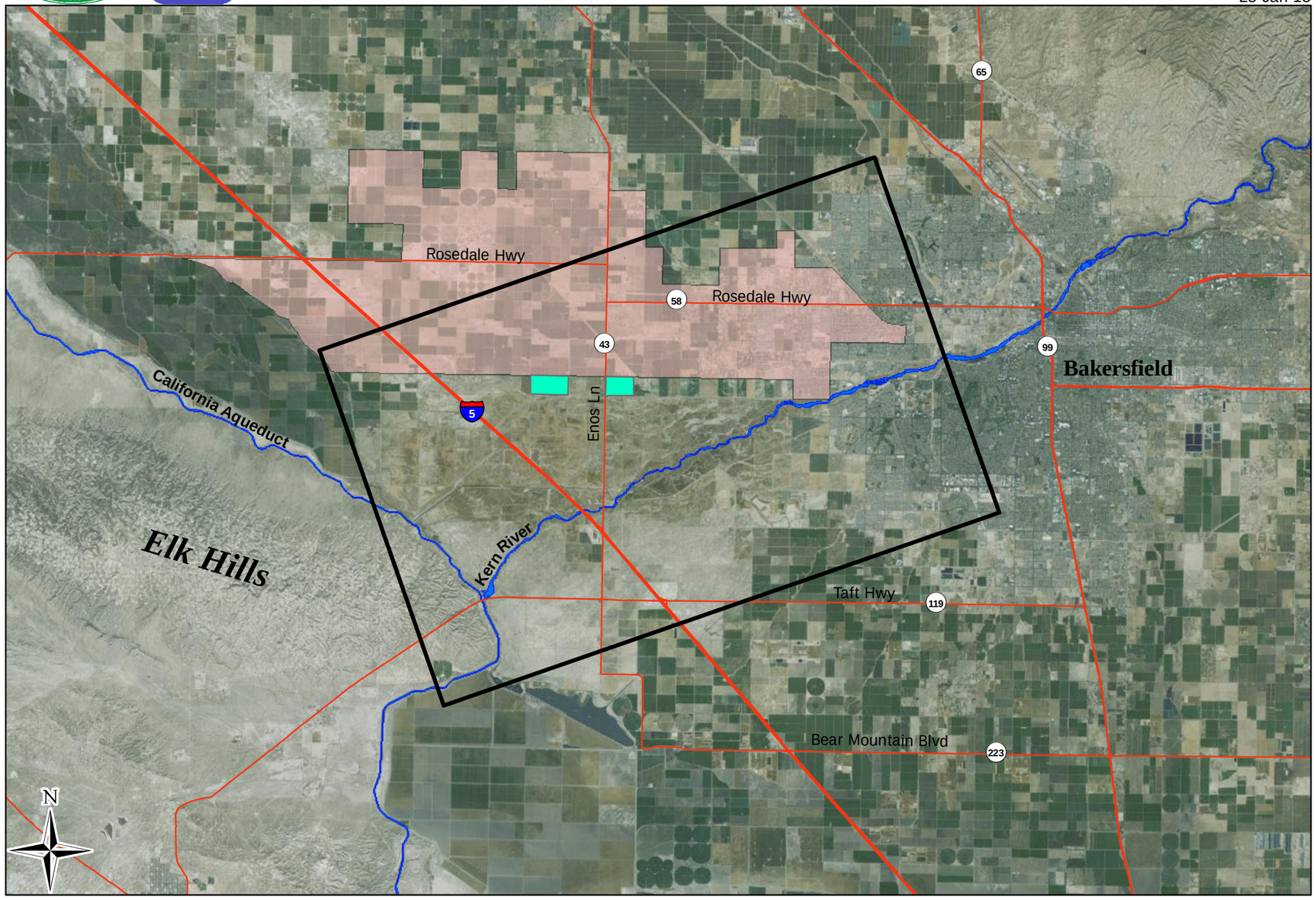
[1] CVC = Cross Valley Canal

Figures

Rosedale-Rio Bravo Water Storage District
Irvine Ranch Water District

23-Jan-15

Evaluation of Potential Groundwater Changes Associated with the Proposed Stockdale Integrated Banking Project



0 2 4 8 Miles

NAD 83 State Plane CA Zone 5
Central Meridian: -118

Basemape source: esri.com

Map Features

- Stockdale Project
- Model Domain
- Rosedale-Rio Bravo Water Storage District
- Interstate
- Major Road
- Water Course

Regional Setting

Regional Map

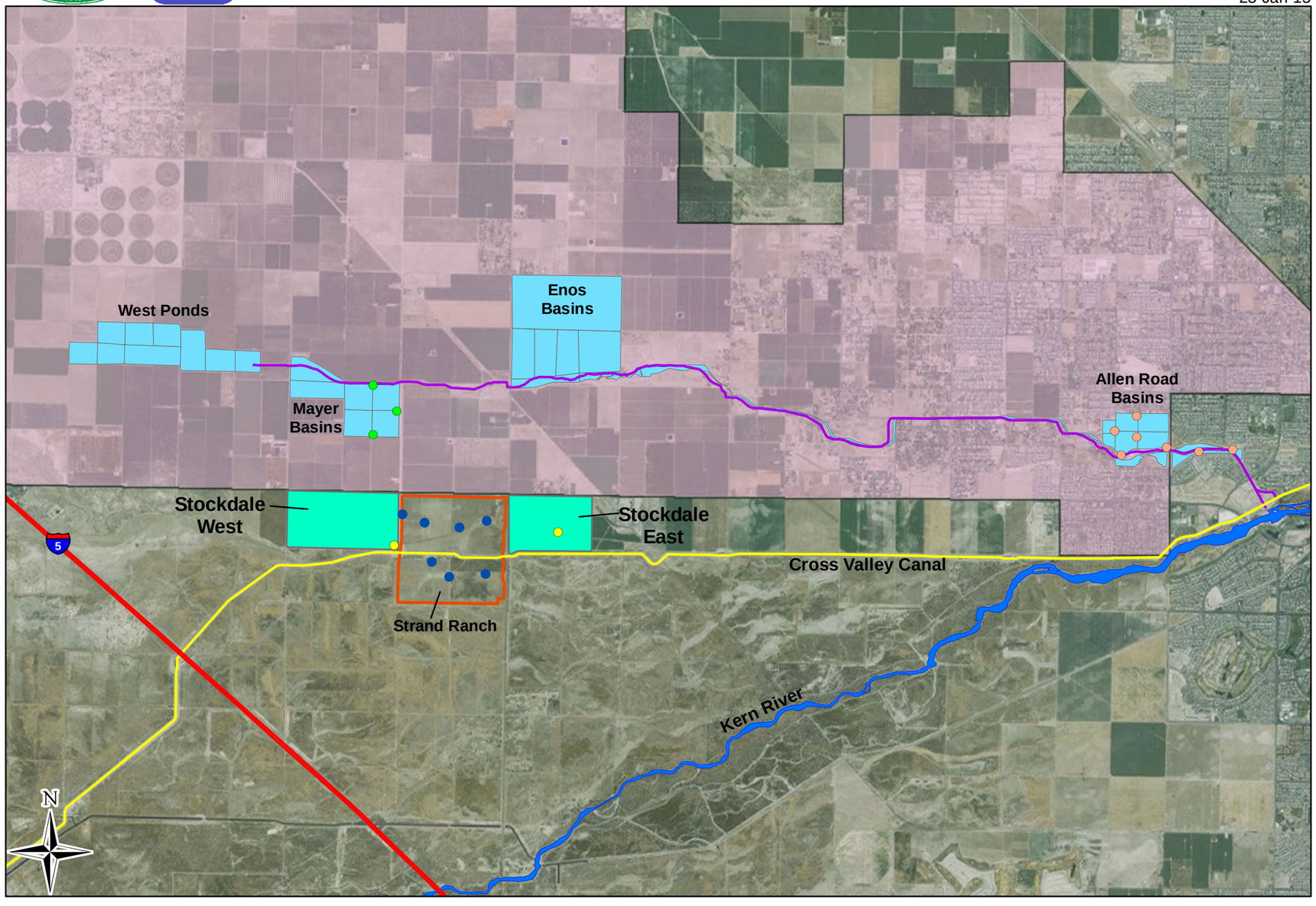
Figure 1

Thomas Harder & Co.
Groundwater Consulting

Rosedale-Rio Bravo Water Storage District
Irvine Ranch Water District

23-Jan-15

Evaluation of Potential Groundwater Changes Associated with the Proposed Stockdale Integrated Banking Project



Basemap source: esri.com

NAD 83 State Plane CA Zone 5
Central Meridian: -118

Map Features

- Existing Stockdale Agricultural Well
- Enns Well
- RRB-ID4 Well
- Strand Ranch Extraction Well
- Lined Canal
- Unlined Canal
- Strand Ranch Project
- Stockdale Project
- Rosedale-Rio Bravo Water Storage District Recharge Basins
- Rosedale-Rio Bravo Water Storage District Service Area
- Water Course
- Interstate 5

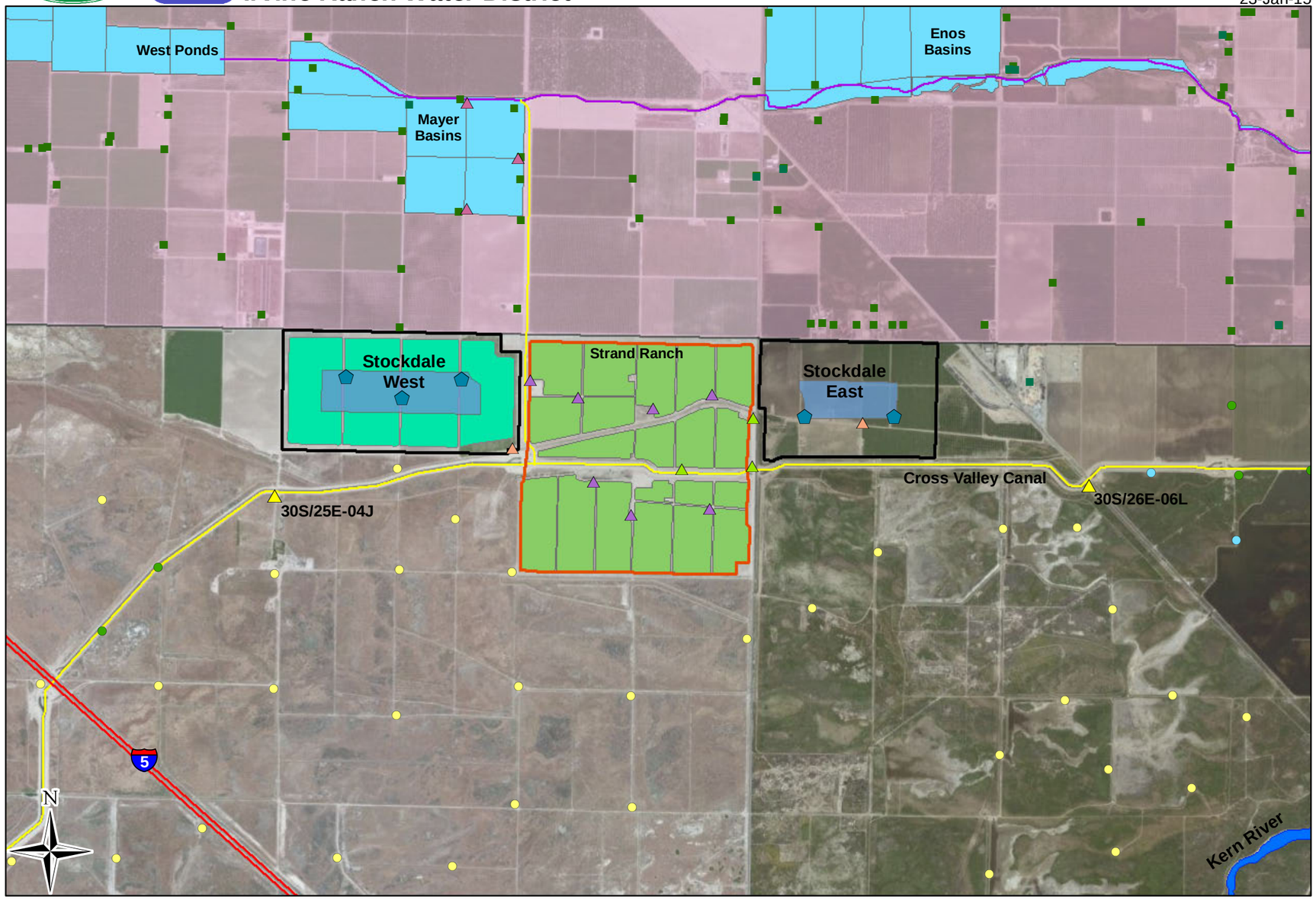
Project Area

Thomas Harder & Co.
Groundwater Consulting

Figure 2

Rosedale-Rio Bravo Water Storage District
Irvine Ranch Water District

23-Jan-15



0 0.5 1 2 Miles

Basemape source: esri.com

NAD 83 State Plane CA Zone 5
Central Meridian: -118

Thomas Harder & Co.
Groundwater Consulting

Evaluation of Potential Groundwater Changes Associated with the Proposed Stockdale Integrated Banking Project

Map Features

- Proposed Well (3,000 ac-ft/yr)
- Existing Stockdale Agricultural Well
- Enns Well
- Strand Ranch Production Well
- Existing Strand Ranch Agricultural Well
- Nested Monitoring Well
- Private Wells in RRBWSD Service Area
- Berrenda Mesa Well
- Kern Water Bank Well
- Pioneer Project Well
- Stockdale West Basin
- Strand Ranch Recharge Basin
- Stockdale Project Property Boundary
- Strand Ranch Project
- Area Available for New Wells
- Rosedale-Rio Bravo Water Storage District Recharge Basins
- Rosedale-Rio Bravo Water Storage District Service Area
- Water Courses
- Unlined Canal
- Lined Canal
- Interstate 5

Area available for new wells is 880 ft inside of property line.

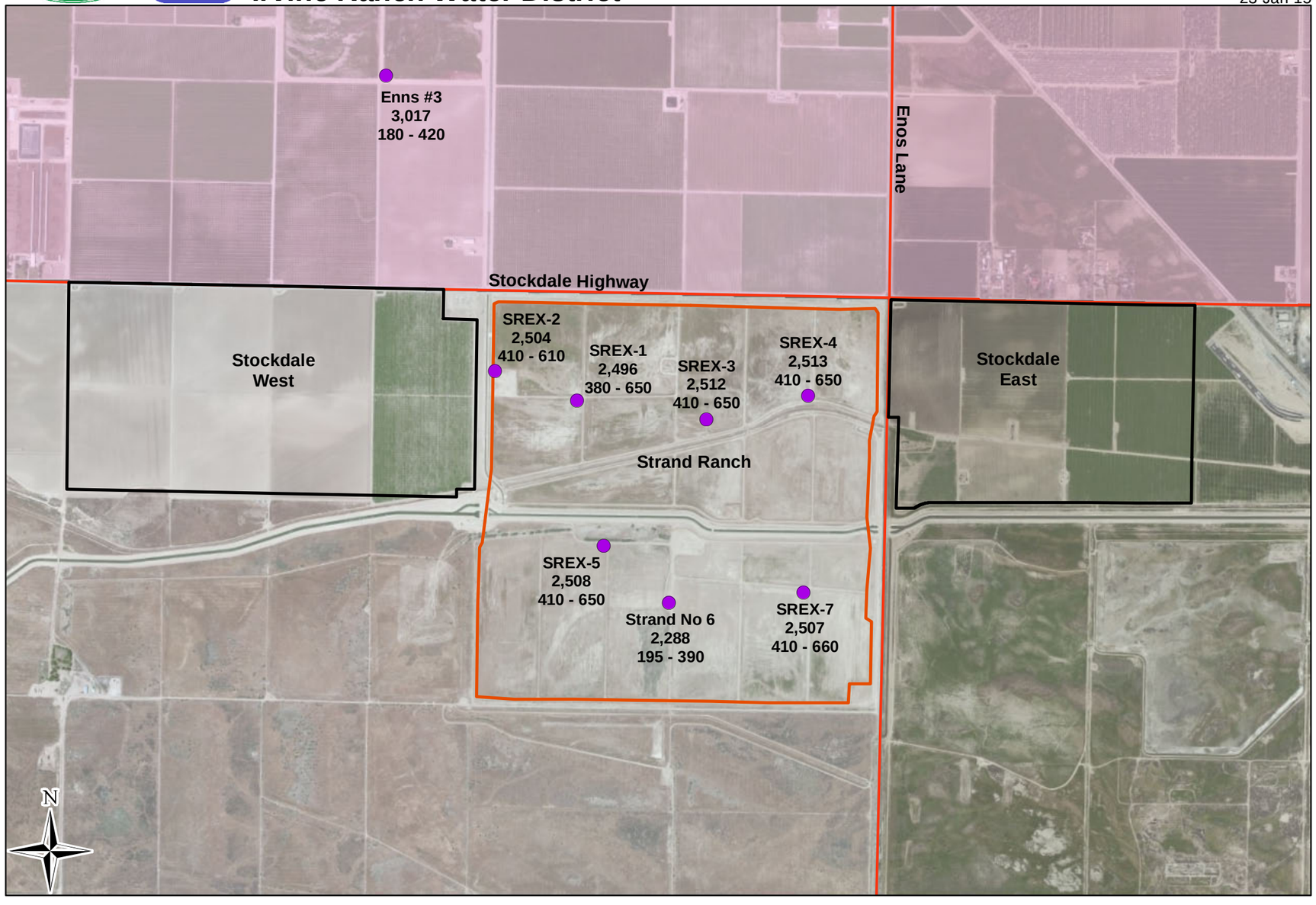
Proposed Project Production Well Locations

Figure 3

Rosedale-Rio Bravo Water Storage District
Irvine Ranch Water District

23-Jan-15

Evaluation of Potential Groundwater Changes Associated with the Proposed Stockdale Integrated Banking Project



Map Features

- **2,504** Discharge Rate (gpm)
- **410 - 610** Perforation Interval (ft bgs)
- Existing Well
- Stockdale Properties
- Strand Ranch Project
- Rosedale-Rio Bravo Water Storage District Service Area
- Road

Sources of Data:
Wildermuth Environmental, 2010d
Wildermuth Environmental, 2011a-e
Zeiders Consulting, 2010, unpublished well data

0 0.25 0.5 1 Miles

NAD 83 State Plane CA Zone 5
Central Meridian: -118

Basemape source: esri.com

Thomas Harder & Co.
Groundwater Consulting

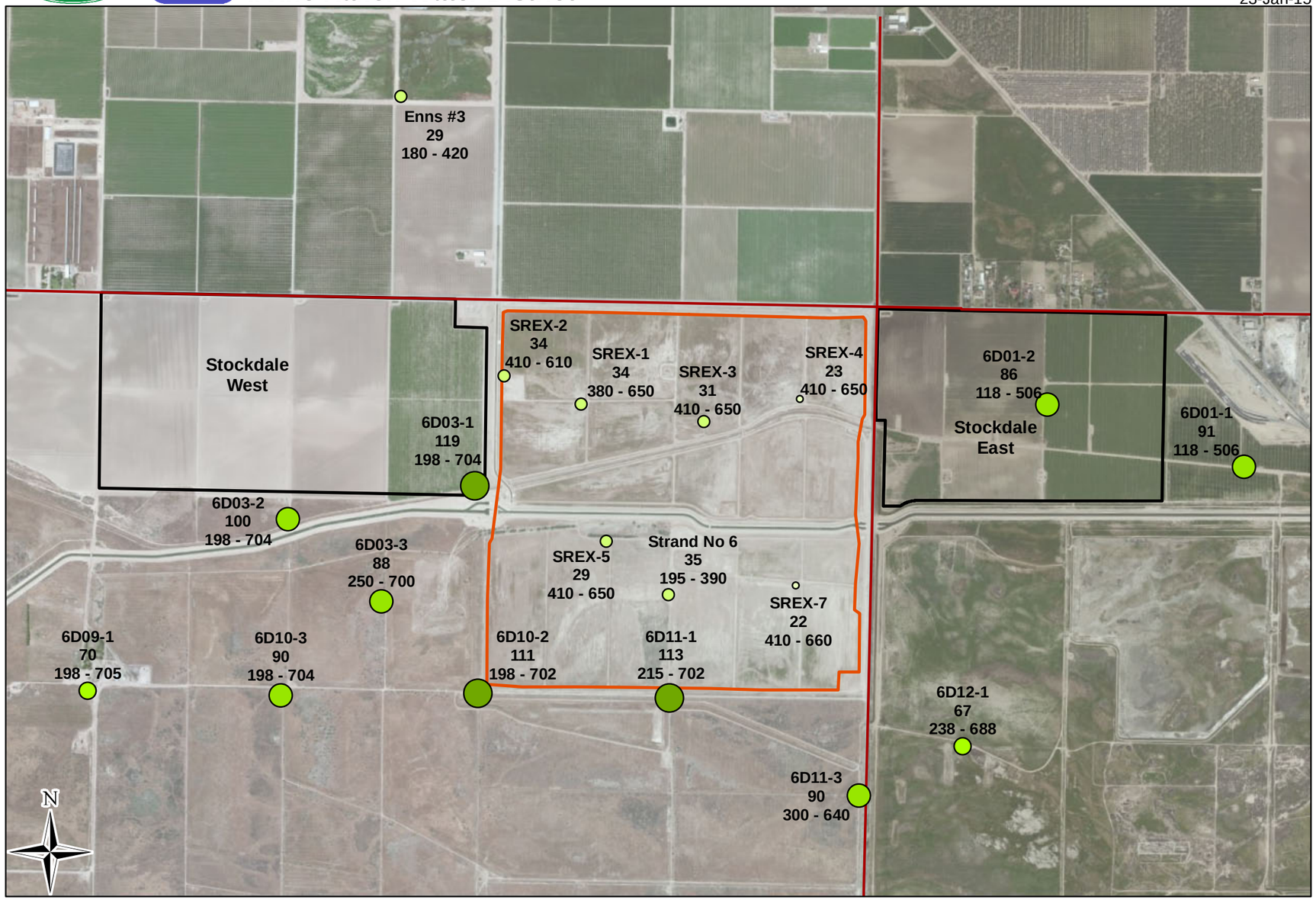
Instantaneous Pumping Rates in the Stockdale East and West Area

Figure 4

Rosedale-Rio Bravo Water Storage District
Irvine Ranch Water District

23-Jan-15

Evaluation of Potential Groundwater Changes Associated with the Proposed Stockdale Integrated Banking Project



NAD 83 State Plane CA Zone 5
Central Meridian: -118

Basemape source: esri.com

Map Features

Existing Well with Specific Capacity and Perforation Interval

23 Specific Capacity (gpm/ft)
410 - 650 Perforation Interval (ft bgs)

- <25
- 25 - 50
- 50 - 75
- 75 - 100
- >100
- Stockdale Properties
- Strand Ranch Project
- Road

Note: Perforation interval in feet below ground surface.

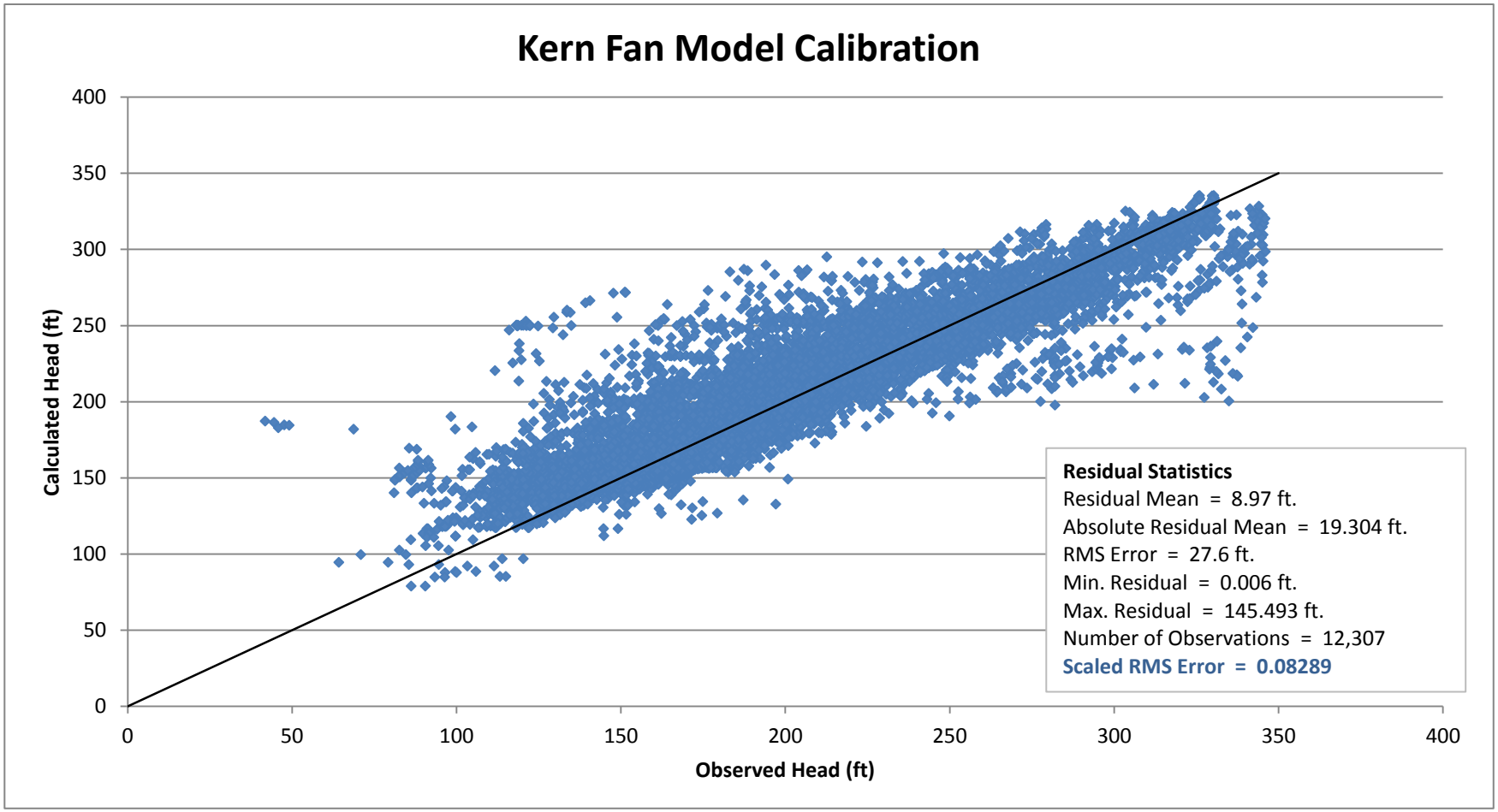
Sources of Data:
Wildermuth Environmental, 2010d
Wildermuth Environmental, 2011a-e
Zeiders Consulting, 2010, unpublished well data

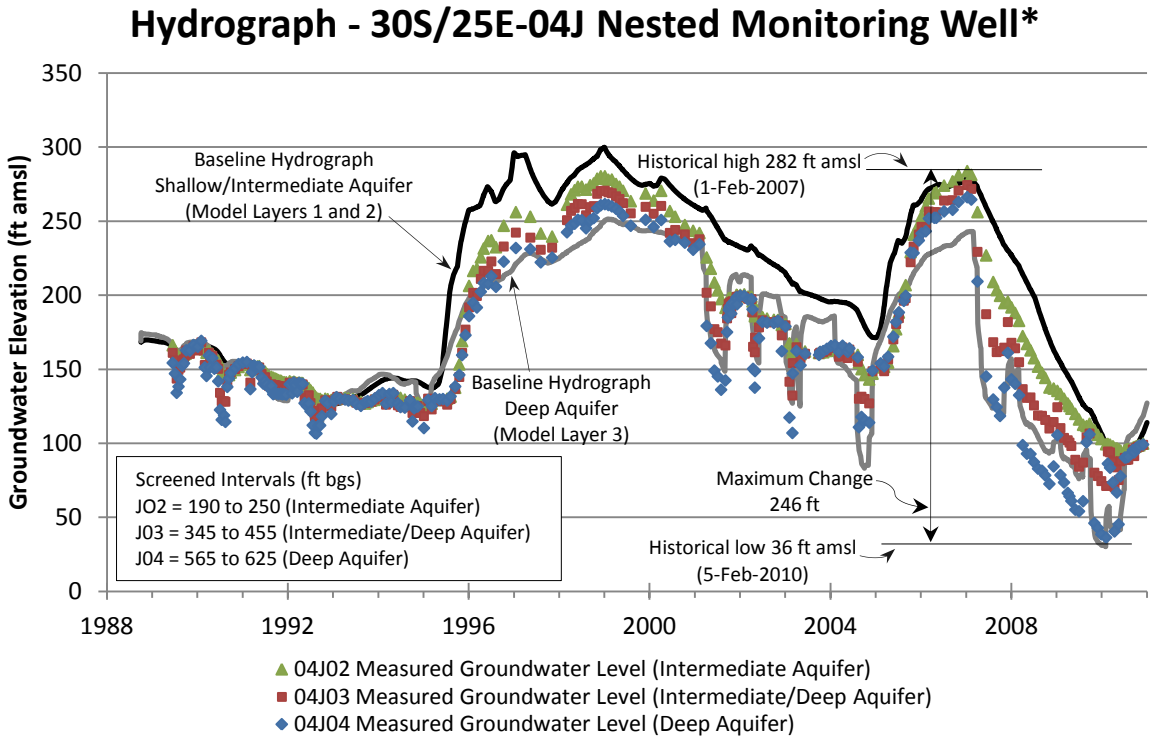
Thomas Harder & Co.
Groundwater Consulting

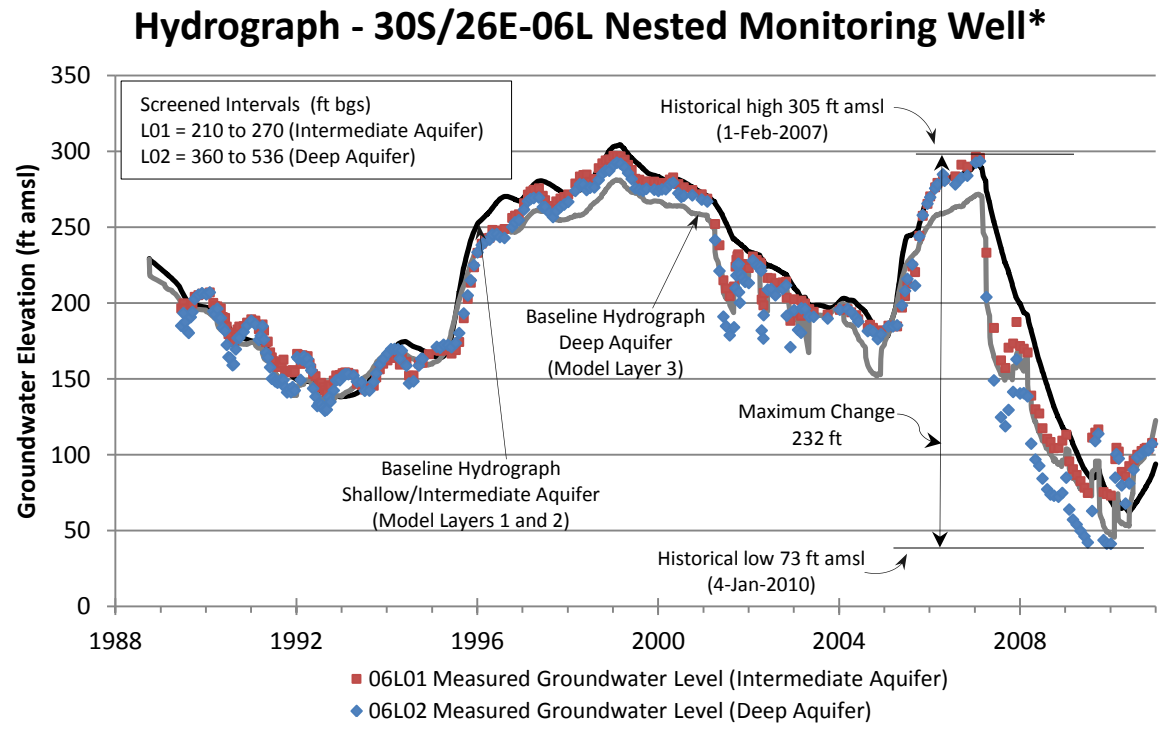
Specific Capacities in the Stockdale East and West Area

Figure 5

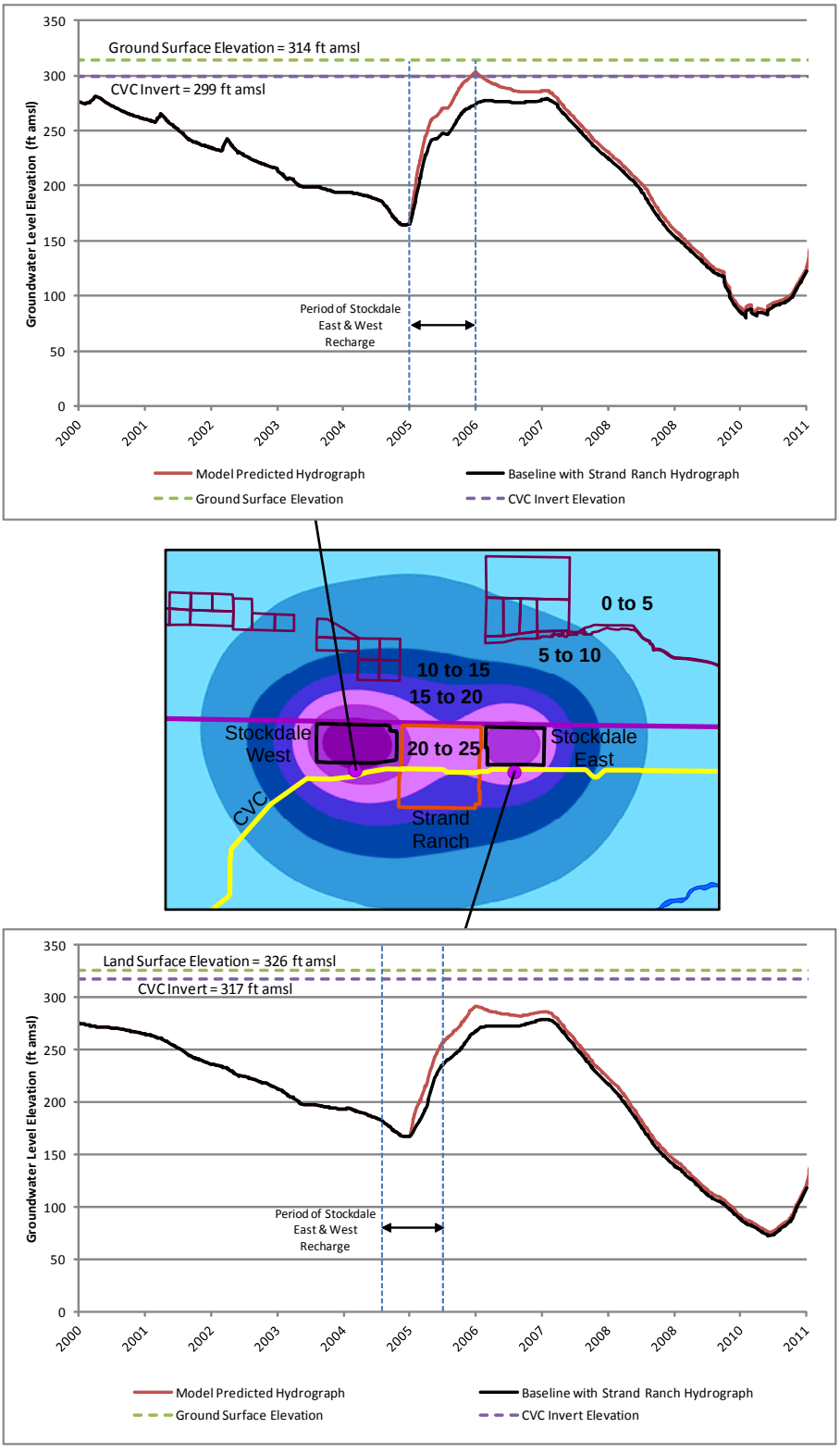
Figure 6


Kern Fan Model Calibration
Calculated Head (ft)
Observed Head (ft)
0
50
100
150
200
250
300
350
400
Residual Statistics
Residual Mean = 8.97 ft.
Absolute Residual Mean = 19.304 ft.
RMS Error = 27.6 ft.
Min. Residual = 0.006 ft.
Max. Residual = 145.493 ft.
Number of Observations = 12,307
Scaled RMS Error = 0.08289





*See Figure 3 for well locations.



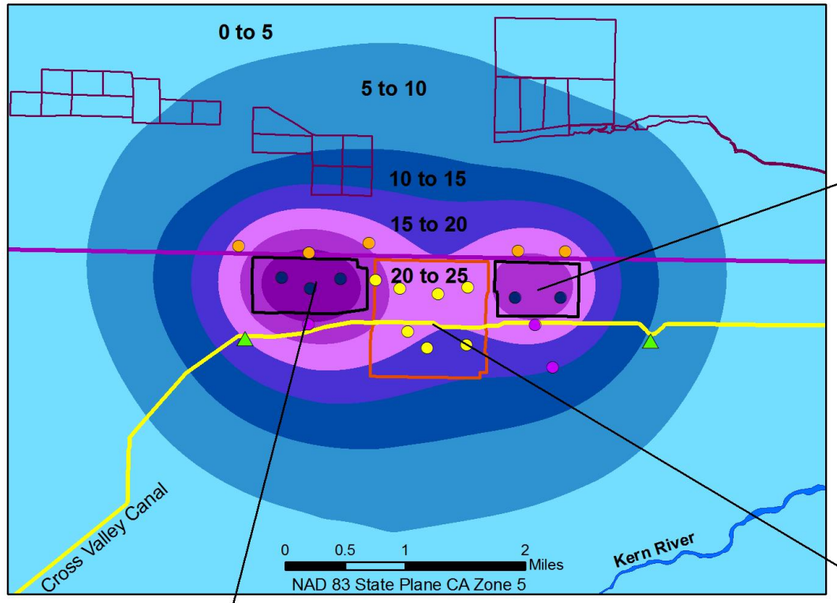
Scenario 1 Predicted Groundwater Mounding Relative to the Cross Valley Canal Shallow/Intermediate Aquifers

Figure 8

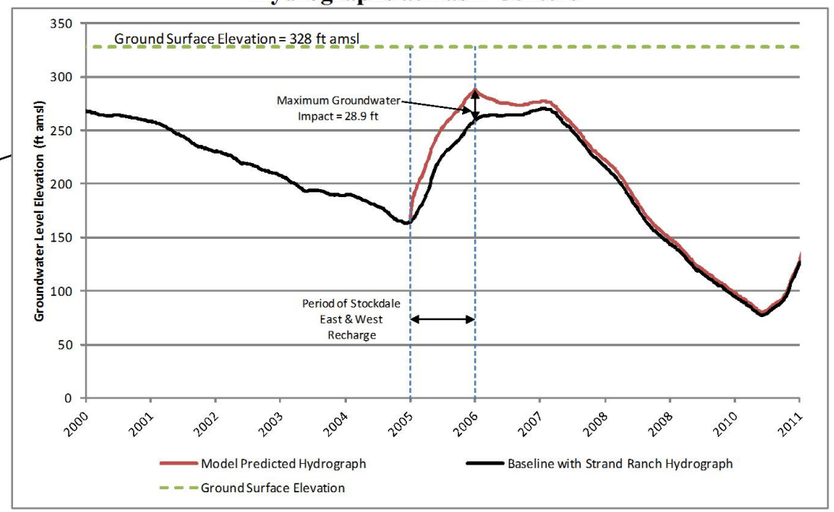
Rosedale-Rio Bravo Water Storage District
Irvine Ranch Water District

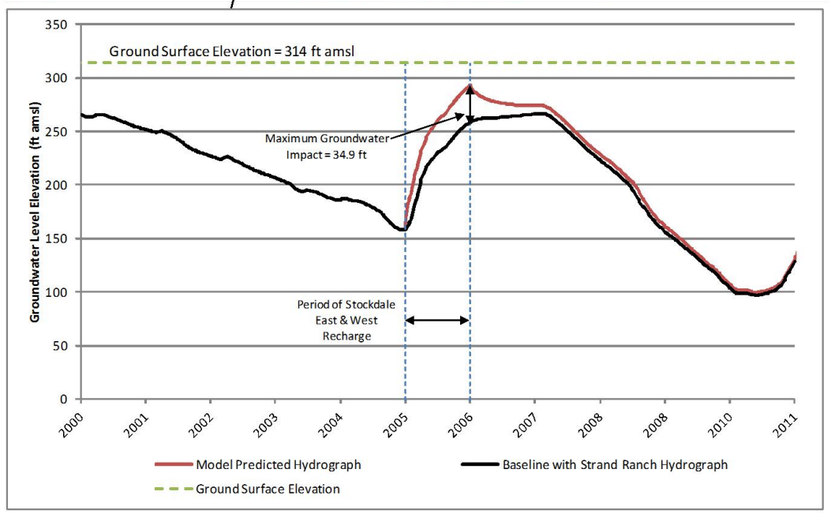
Evaluation of Potential Groundwater Changes Associated with the Proposed Stockdale Integrated Banking Project

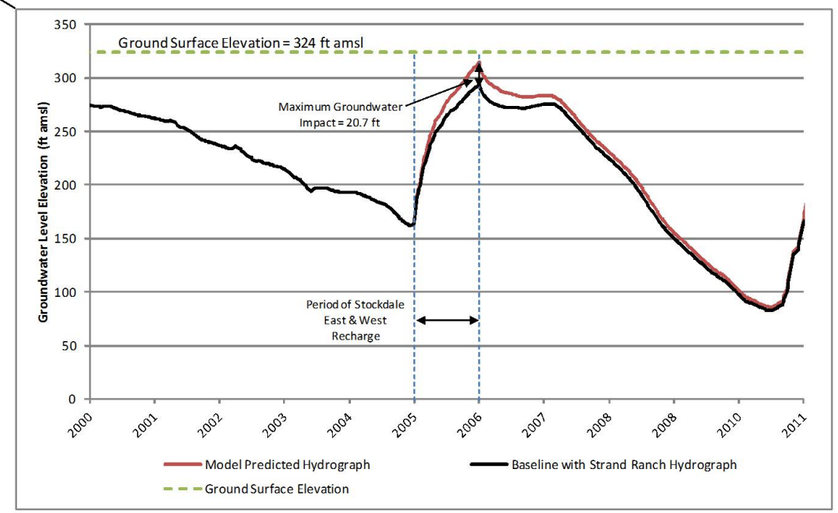
Model - Predicted Recharge Mounding Relative to Baseline Shallow and Intermediate Aquifers (Model Layers 1 and 2)



Hydrographs at Basin Centers







Map Features

- Groundwater Level Change (ft)
  - 30 to 35
  - 25 to 30
  - 20 to 25
  - 15 to 20
  - 10 to 15
  - 5 to 10
  - 0 to 5
- Preliminary Stockdale Well
- Observation Point
- Private Well
- Monitoring Well
- Strand Ranch Production Well
- Stockdale Recharge Basin
- Strand Ranch Recharge Basin
- Rosedale-Rio Bravo Water Storage District Recharge Basin
- Rosedale-Rio Bravo Water Storage District
- Cross Valley Canal
- Water Course

This figure shows that Project recharge during high groundwater level conditions is predicted to result in a maximum increase in the shallow and intermediate aquifers (layers 1 and 2), relative to the hydrologic baseline, of approximately 35 ft beneath Stockdale West and 29 ft beneath Stockdale East.

23-Jan-15

Thomas Harder & Co.
Groundwater Consulting

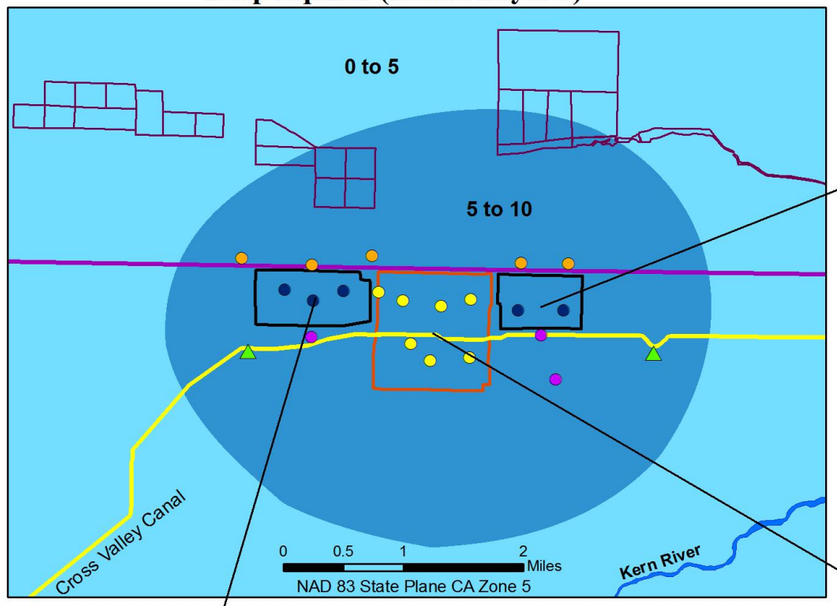
Scenario 1 Model-Predicted Groundwater Recharge Mounding Relative to Baseline Shallow/Intermediate Aquifers

Figure 9

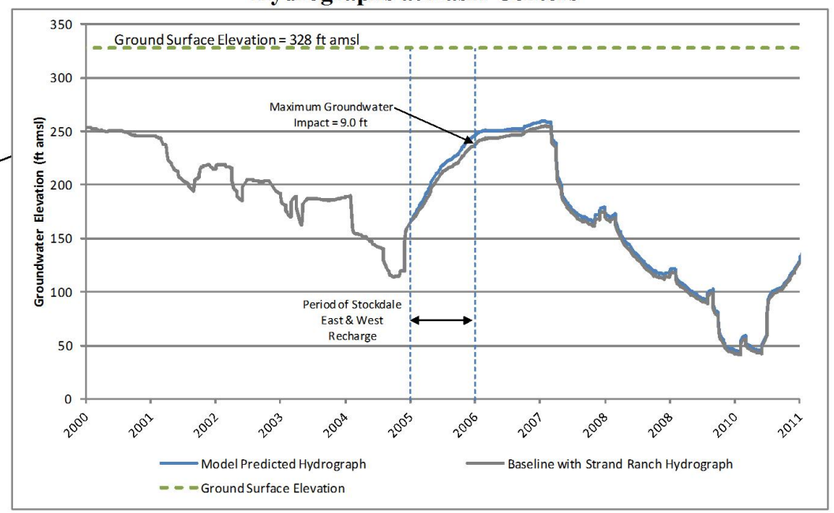
Rosedale-Rio Bravo Water Storage District
Irvine Ranch Water District

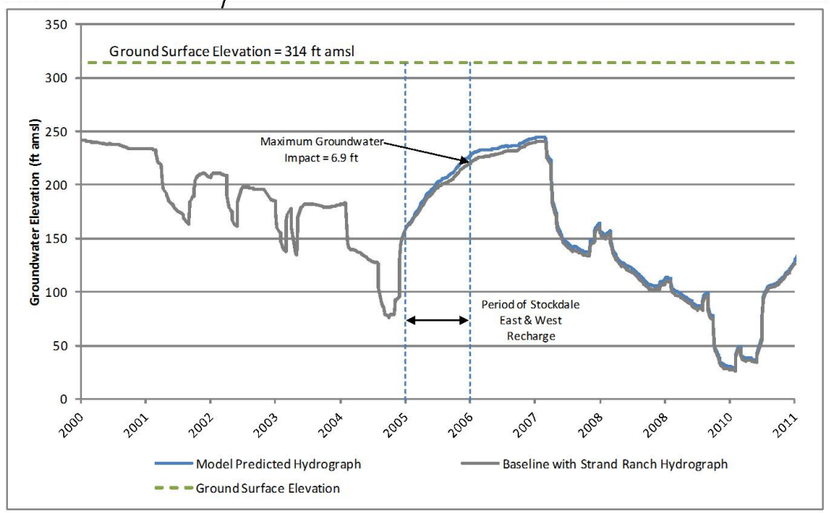
Evaluation of Potential Groundwater Changes Associated with the Proposed Stockdale Integrated Banking Project

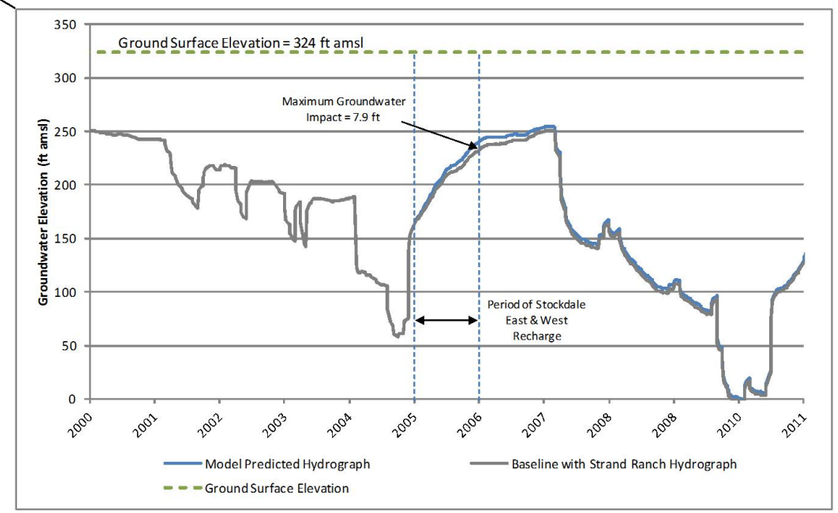
Model-Predicted Recharge Mounding Relative to Baseline Deep Aquifer (Model Layer 3)



Hydrographs at Basin Centers







Map Features

- Groundwater Level Change (ft)
  - 5 to 10
  - 0 to 5
- Preliminary Stockdale Well
- Observation Point
- Private Well
- Monitoring Well
- Strand Ranch Production Well
- Stockdale Recharge Basin
- Strand Ranch Recharge Basin
- Rosedale-Rio Bravo Water Storage District Recharge Basin
- Rosedale-Rio Bravo Water Storage District
- Cross Valley Canal
- Water Course

This figure shows that Project recharge during high groundwater level conditions is predicted to result in a maximum increase in the deeper aquifer (layer 3), relative to the hydrologic baseline, of approximately 7 ft beneath Stockdale West and 9 ft beneath Stockdale East.

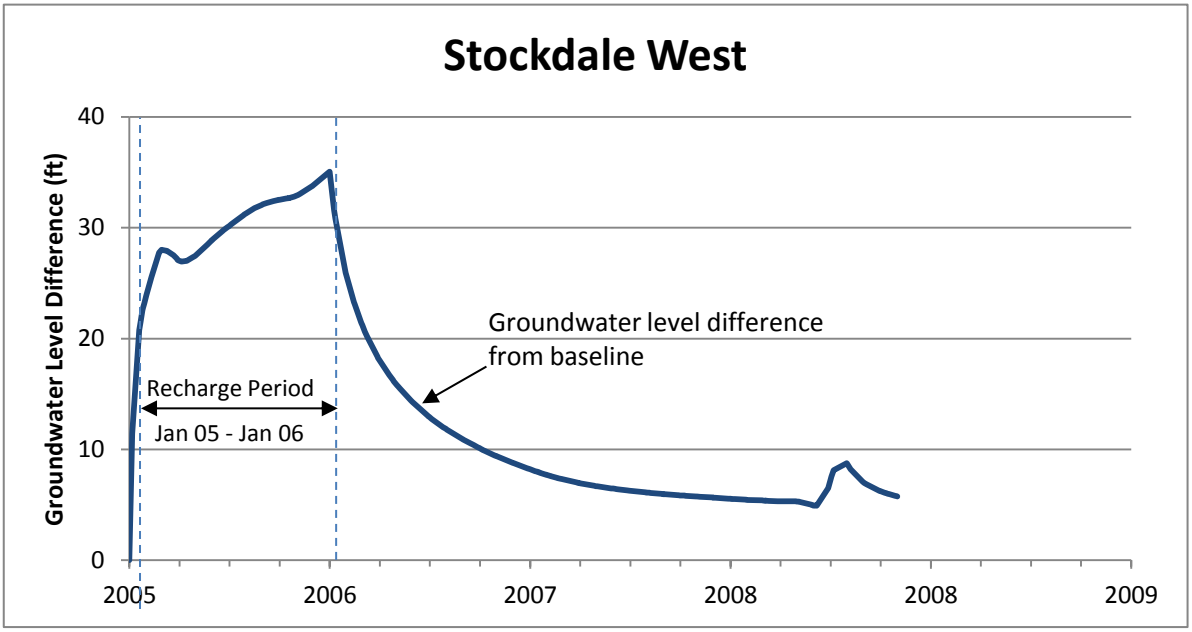
23-Jan-15

Scenario 1 Model-Predicted Groundwater Recharge Mounding Relative to Baseline Deep Aquifer

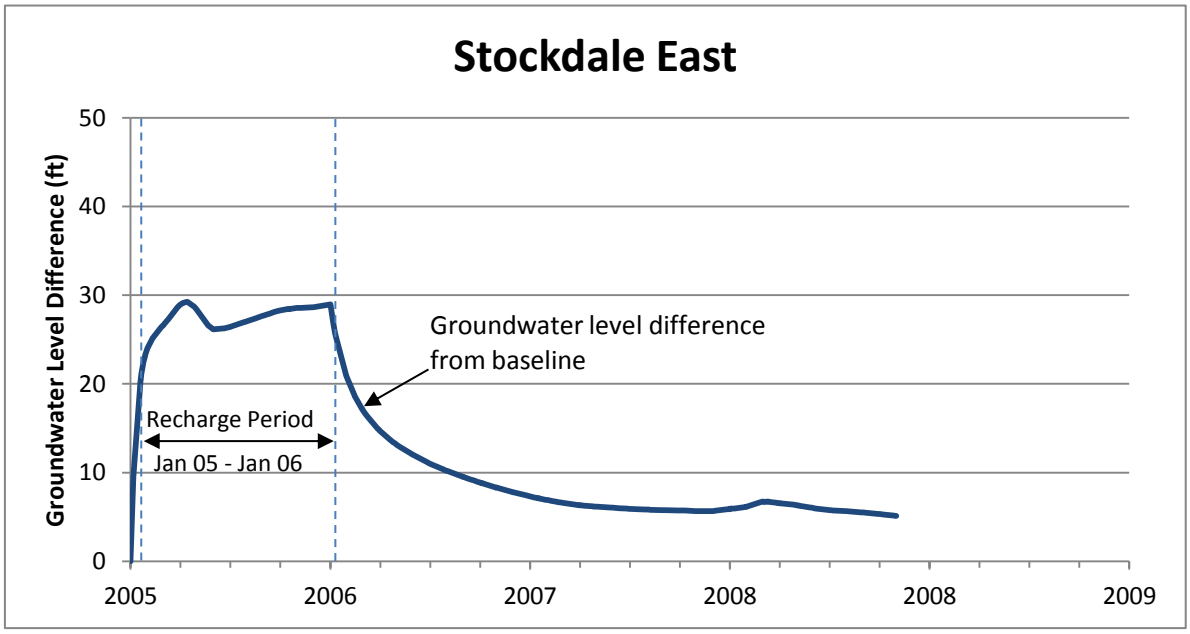
Figure 10

Thomas Harder & Co.
Groundwater Consulting

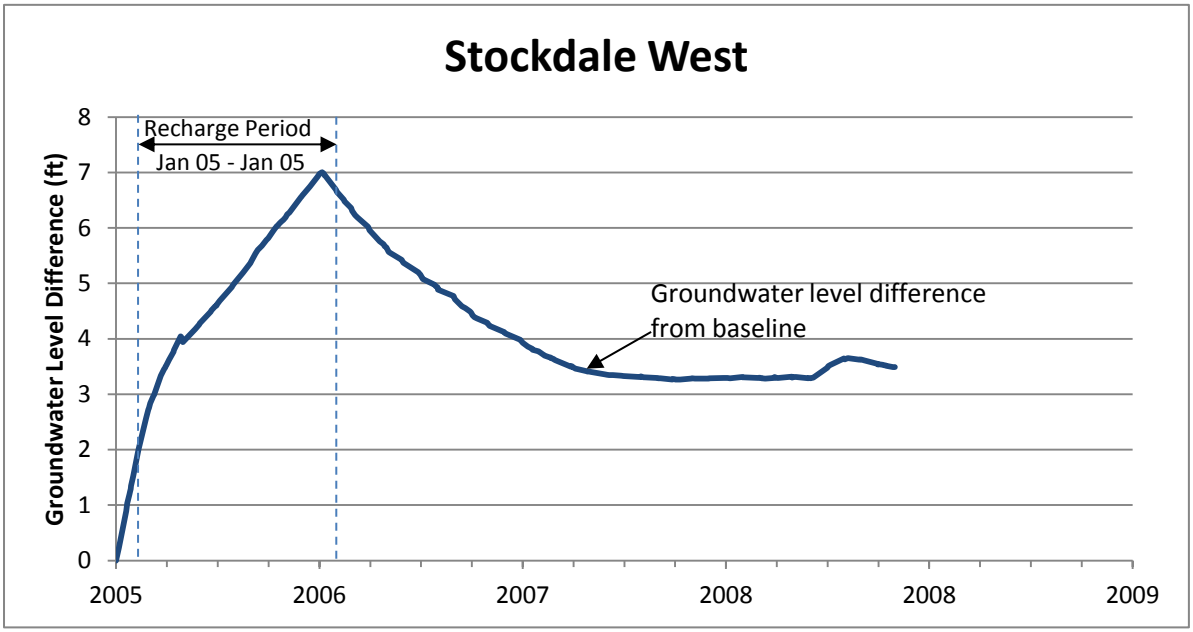
Model-Predicted Groundwater Level Change Over Time
Scenario 1, Shallow/Intermediate Aquifers - Groundwater Recharge



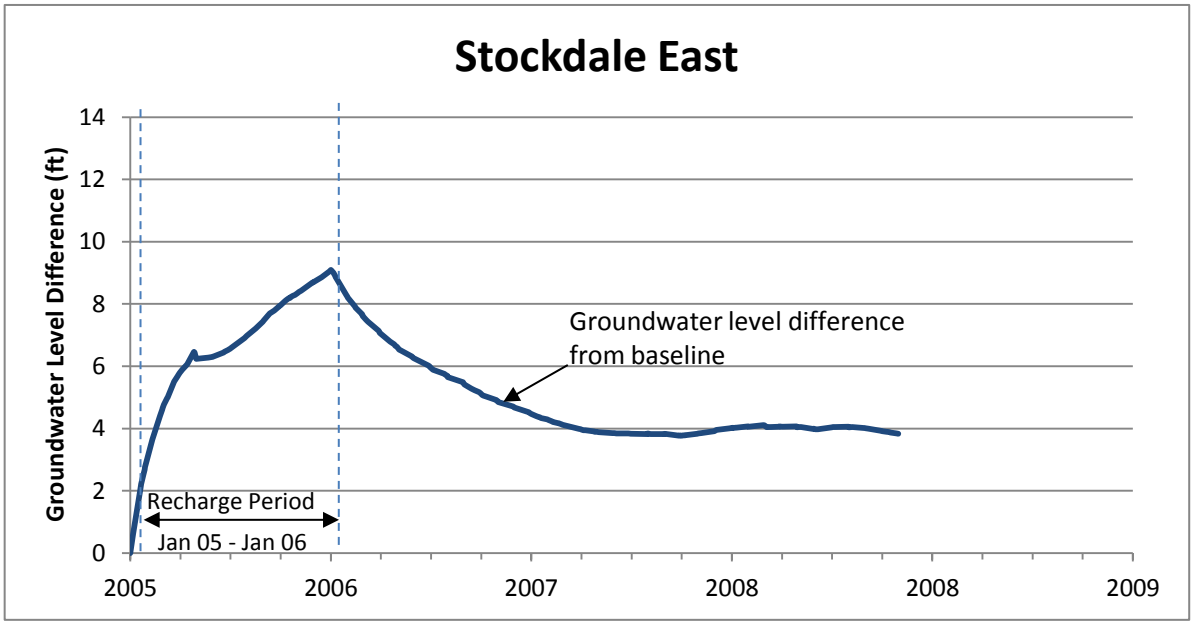
This figure shows the rate that groundwater mounding subsides following the recharge event. As shown, the groundwater mound associated with the Project subsides to within 10-ft of the pre-recharge groundwater level in less than 1 year.



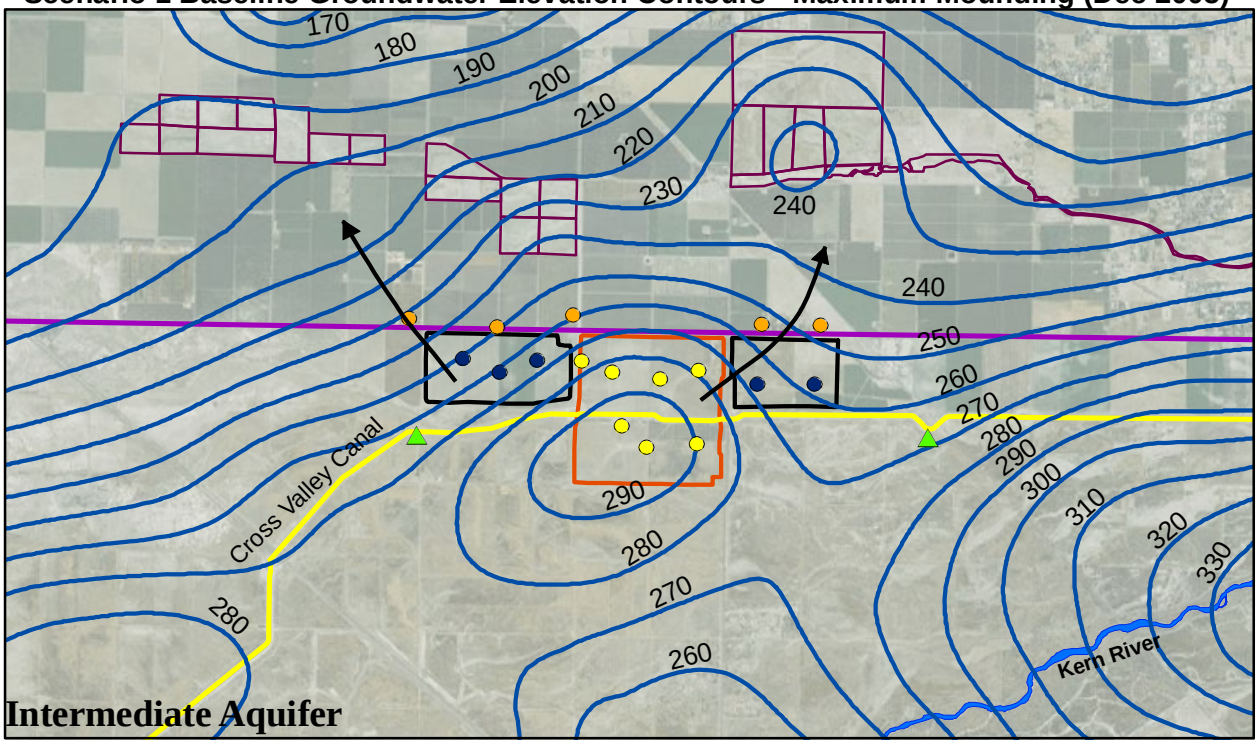
Model-Predicted Groundwater Level Change Over Time
Scenario 1, Deep Aquifer - Groundwater Recharge



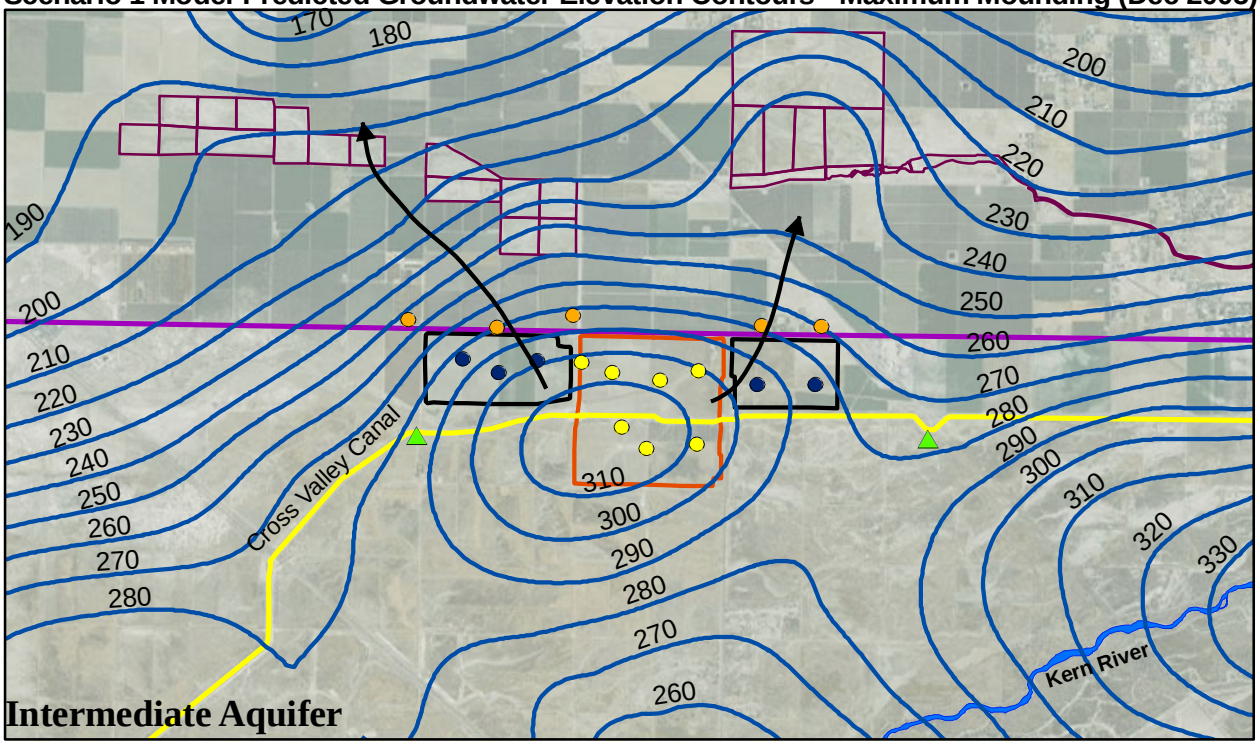
This figure shows the rate that groundwater mounding subsides following the recharge event. As shown, the groundwater mound associated with the Project subsides to within 5-ft of the pre-recharge groundwater level in less than 1 year.



Scenario 1 Baseline Groundwater Elevation Contours - Maximum Mounding (Dec 2005)



Scenario 1 Model-Predicted Groundwater Elevation Contours - Maximum Mounding (Dec 2005)



Groundwater Flow Direction

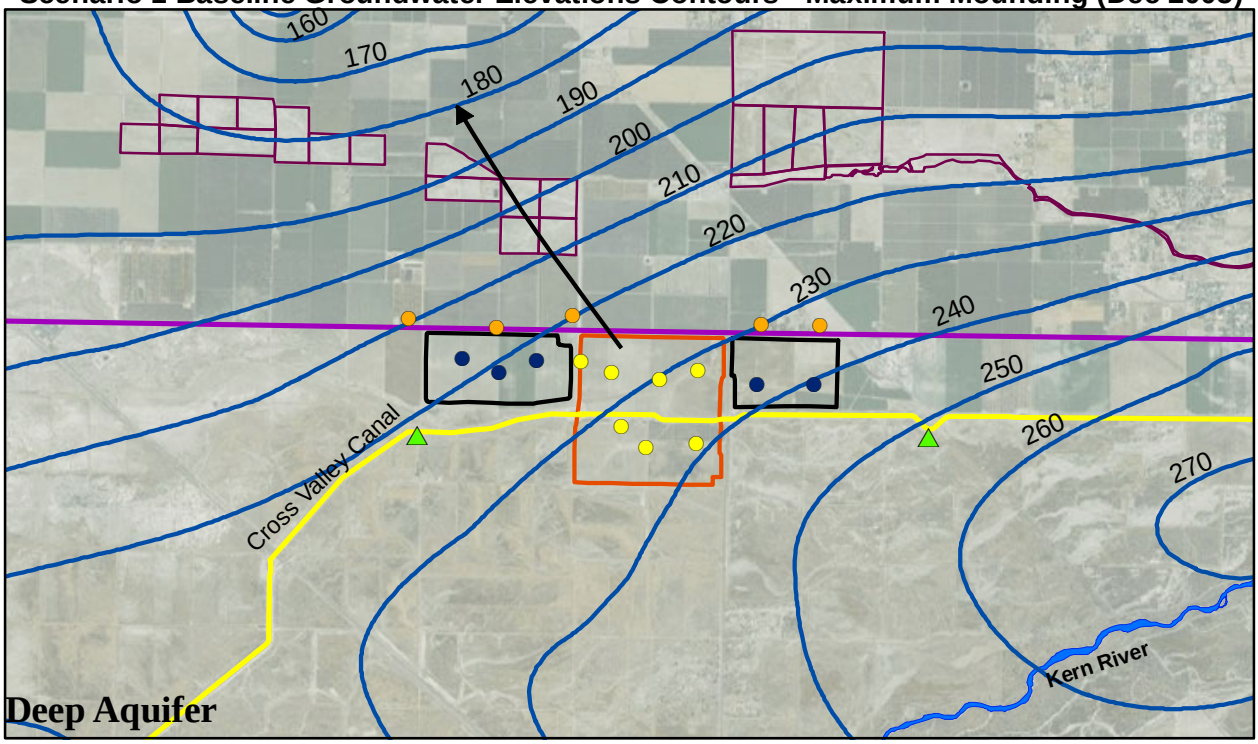
0 0.5 1 2 Miles

NAD 83 State Plane CA Zone 5
Groundwater contours in ft amsl

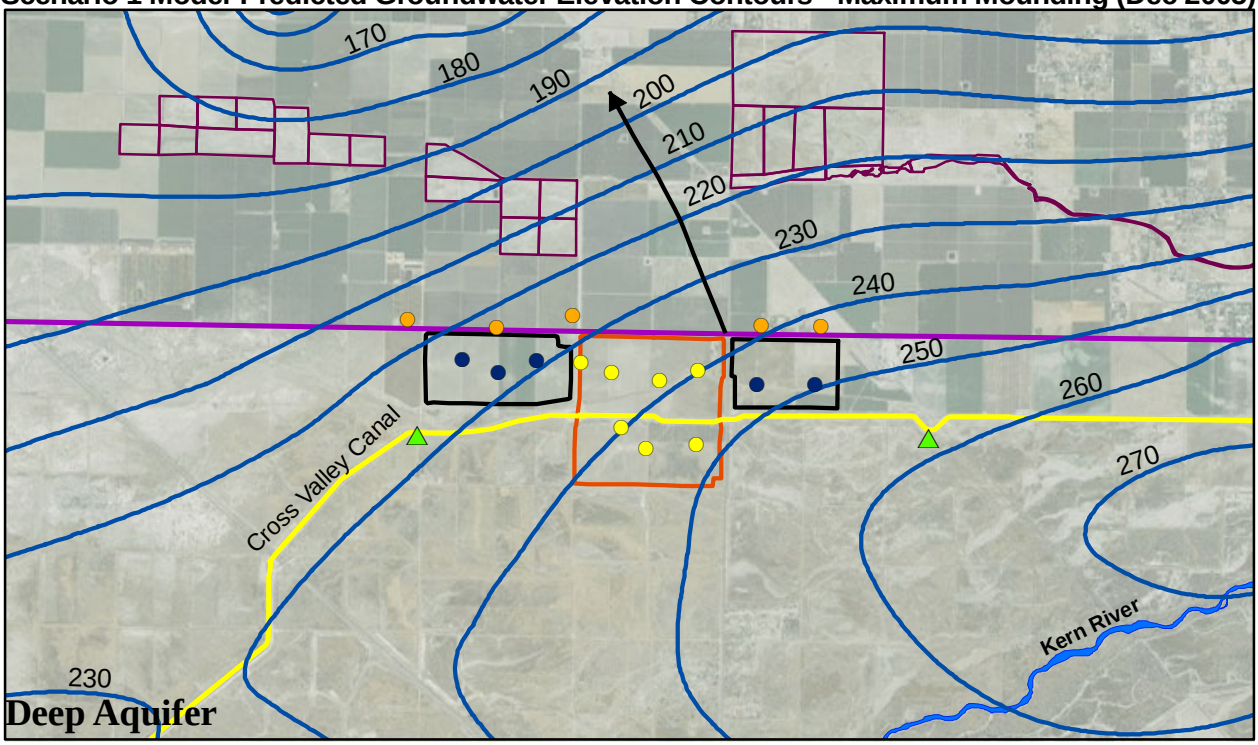
Thomas Harder & Co.
Groundwater Consulting

Figure 13

Scenario 1 Baseline Groundwater Elevations Contours - Maximum Mounding (Dec 2005)



Scenario 1 Model-Predicted Groundwater Elevation Contours - Maximum Mounding (Dec 2005)



Groundwater Flow Direction

0 0.5 1 2 Miles

NAD 83 State Plane CA Zone 5
Groundwater contours in ft amsl

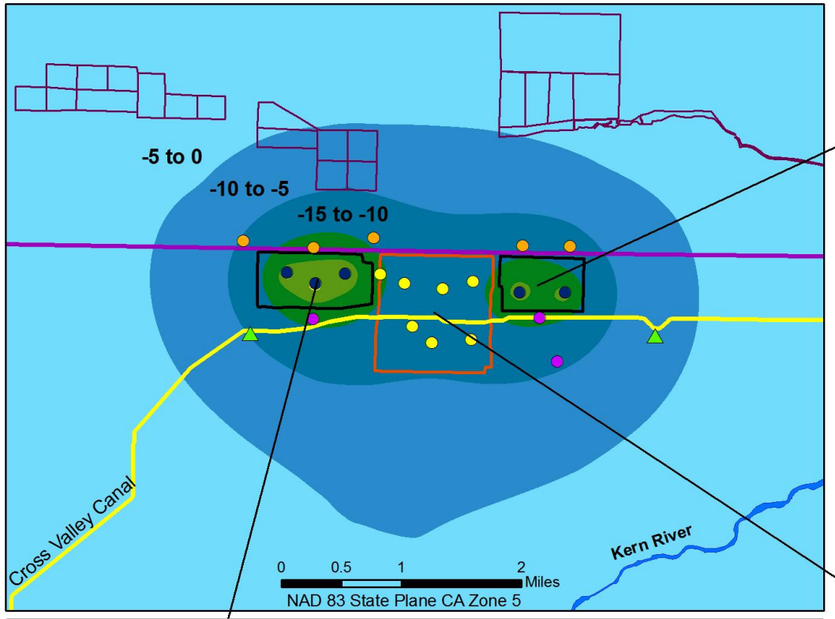
Thomas Harder & Co.
Groundwater Consulting

Figure 14

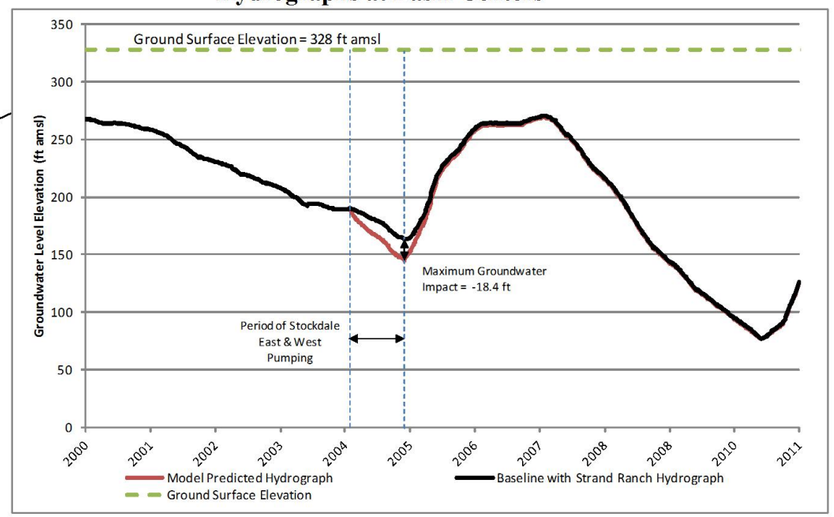
Rosedale-Rio Bravo Water Storage District
Irvine Ranch Water District

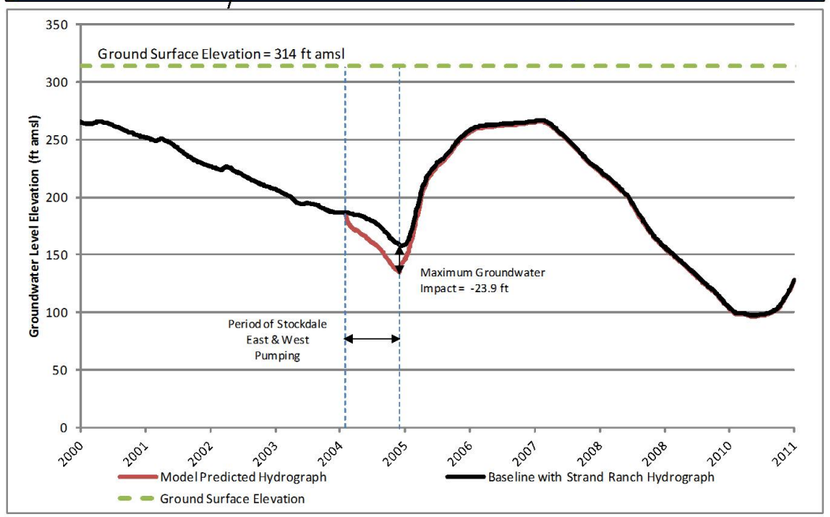
Evaluation of Potential Groundwater Changes Associated with the Proposed Stockdale Integrated Banking Project

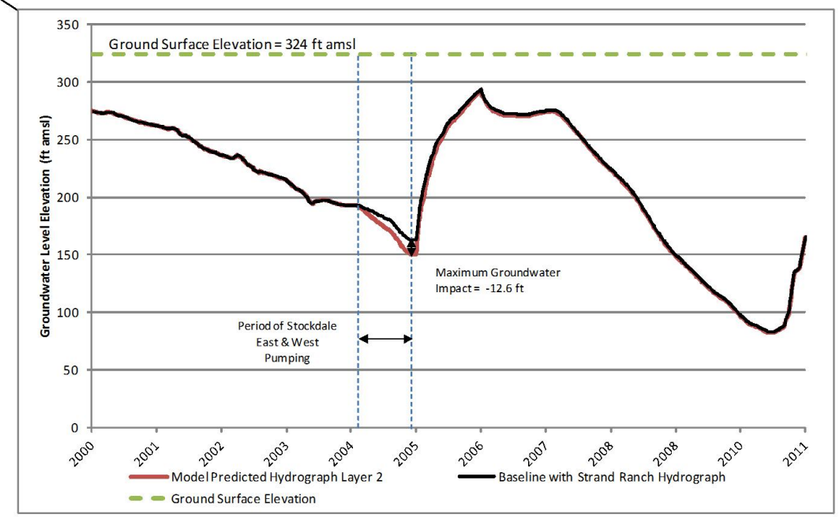
Model - Predicted Pumping Drawdown Relative to Baseline Shallow and Intermediate Aquifers (Model Layers 1 and 2)



Hydrographs at Basin Centers







Map Features

- Groundwater Level Change (ft)
  - -5 to 0
  - -10 to -5
  - -15 to -10
  - -20 to -15
  - -25 to -20
  - -30 to -25
- Observation Point
- Private Well
- Preliminary Stockdale Well
- Monitoring Well
- Strand Ranch Production Well
- Stockdale Recharge Basin
- Strand Ranch Recharge Basin
- Rosedale-Rio Bravo Water Storage District Recharge Basin
- Rosedale-Rio Bravo Water Storage District
- Cross Valley Canal
- Water Course

This figure shows that combined Project pumping during low groundwater level conditions is predicted to result in a maximum drawdown, relative to the baseline, of approximately 24 ft beneath Stockdale West and approximately 18 ft beneath Stockdale East. Maximum drawdown at existing wells is expected to range from approximately 11 to 17 ft.

23-Jan-15

Scenario 2 Model-Predicted Pumping Drawdown Relative to Baseline Shallow/Intermediate Aquifers

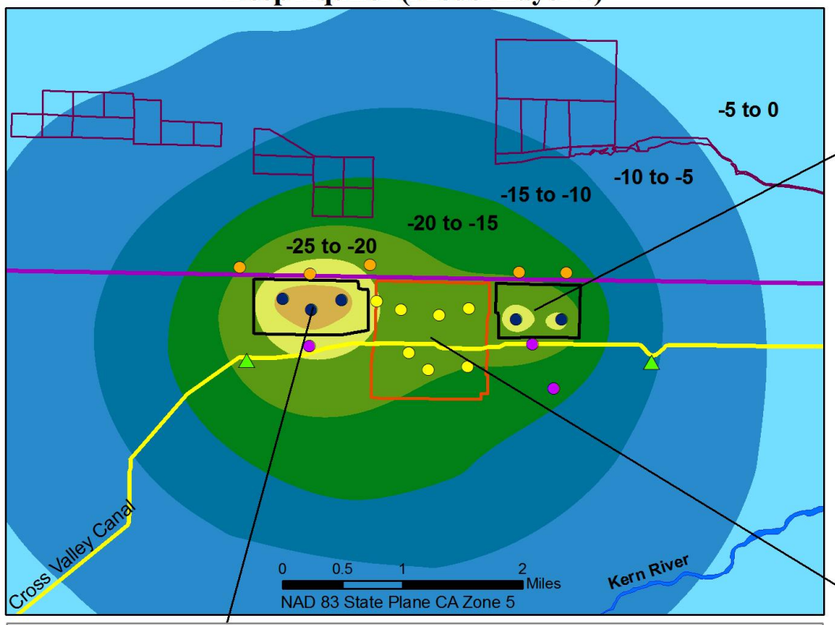
Figure 15

Thomas Harder & Co.
Groundwater Consulting

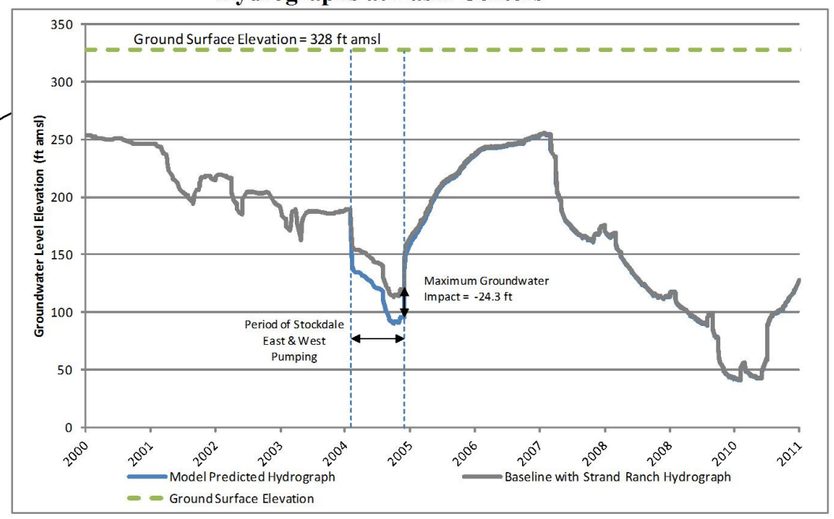
Rosedale-Rio Bravo Water Storage District
Irvine Ranch Water District

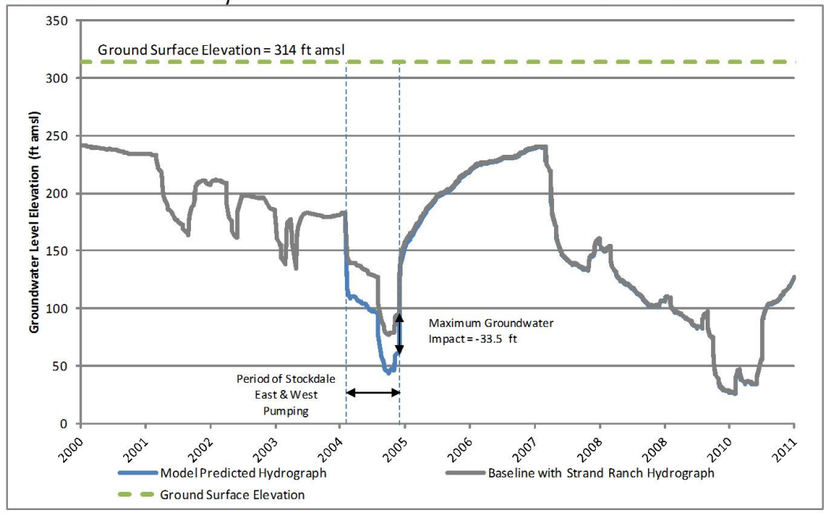
Evaluation of Potential Groundwater Changes Associated with the Proposed Stockdale Integrated Banking Project

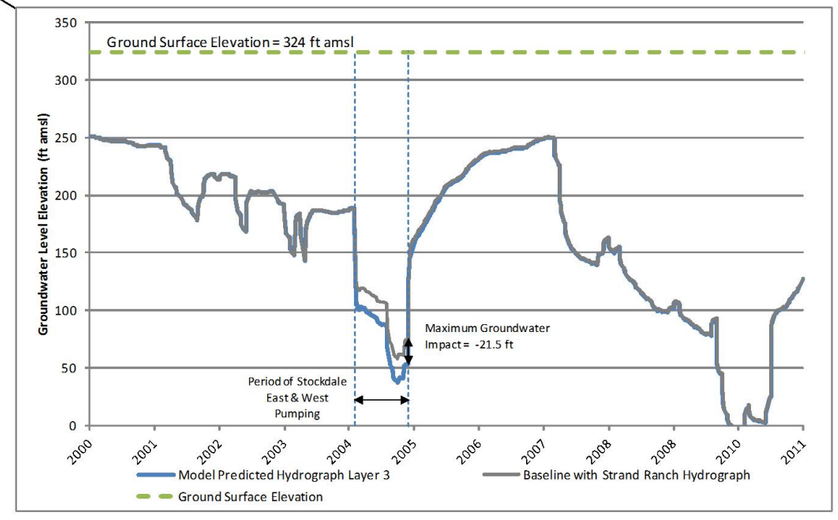
Model-Predicted Pumping Drawdown Relative to Baseline Deep Aquifer (Model Layer 3)



Hydrographs at Basin Centers







Map Features

Groundwater Level Change (ft)
- -5 to 0
- -10 to -5
- -15 to -10
- -20 to -15
- -25 to -20
- -30 to -25
- -35 to -30
- -40 to -35

- Preliminary Stockdale Well
- Observation Point
- Private Well
- Monitoring Well
- Strand Ranch Production Well
- Stockdale Recharge Basin
- Strand Ranch Recharge Basin
- Rosedale-Rio Bravo Water Storage District Recharge Basin
- Rosedale-Rio Bravo Water Storage District
- Cross Valley Canal
- Water Course

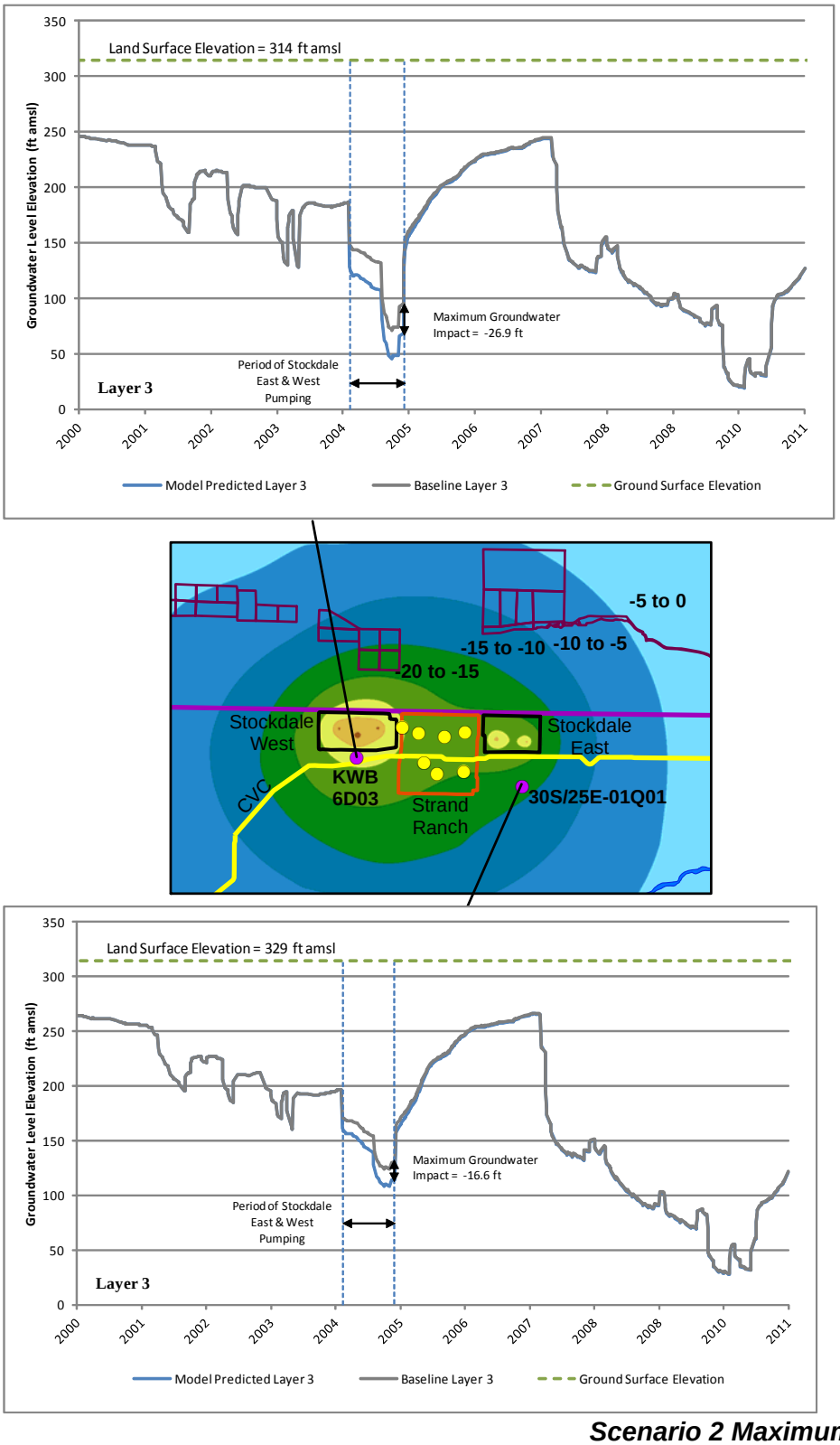
This figure shows that combined Project pumping during low groundwater level conditions is predicted to result in a maximum drawdown, relative to the baseline, of approximately 34 ft beneath Stockdale West and approximately 24 ft beneath Stockdale East. Maximum drawdown at existing wells is expected to range from approximately 20 to 28 ft.

23-Jan-15

Scenario 2 Model-Predicted Pumping Drawdown Relative to Baseline Deep Auqifer

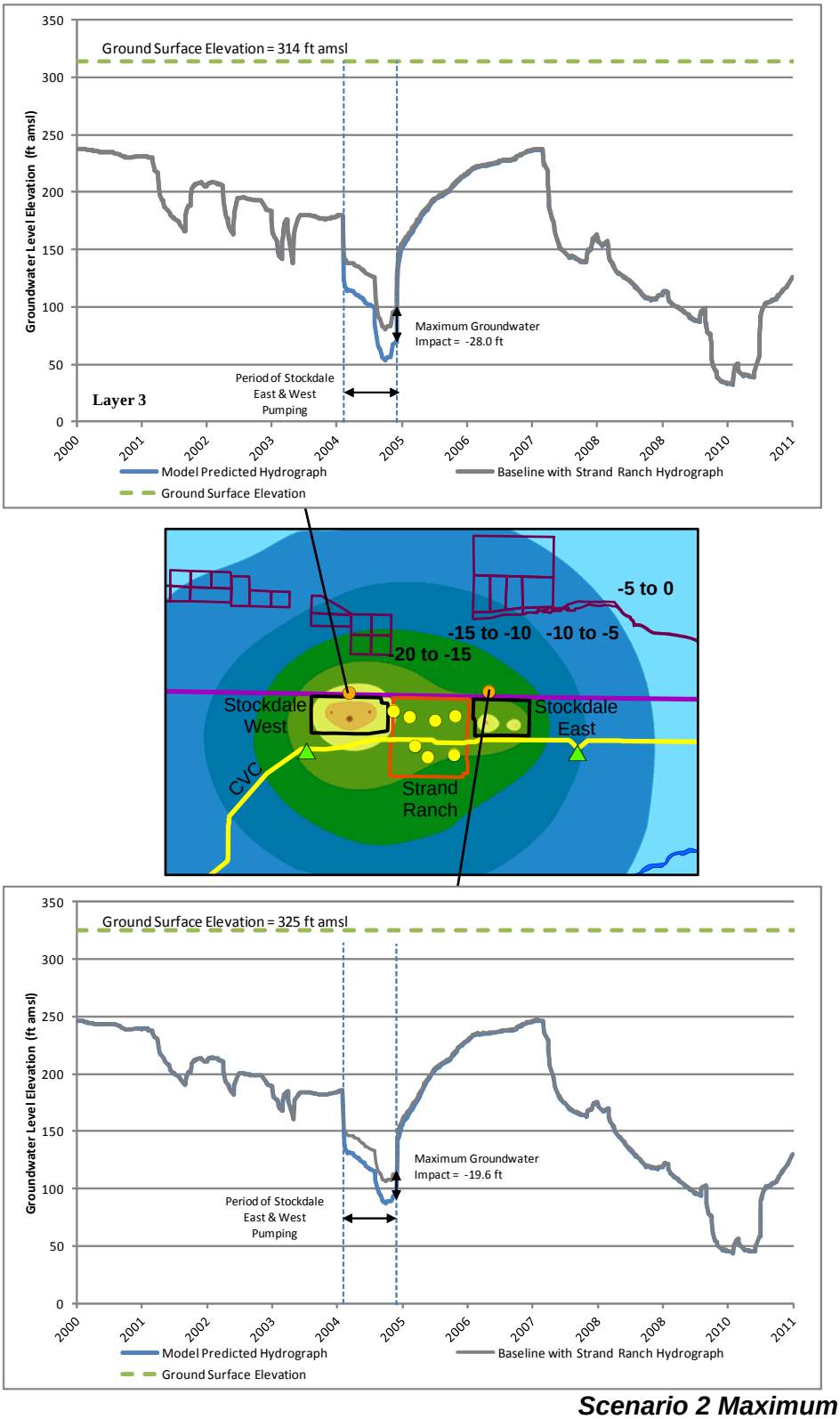
Figure 16

Thomas Harder & Co.
Groundwater Consulting



Scenario 2 Maximum Predicted Pumping Drawdown at Nearest Production Wells Deep Aquifer

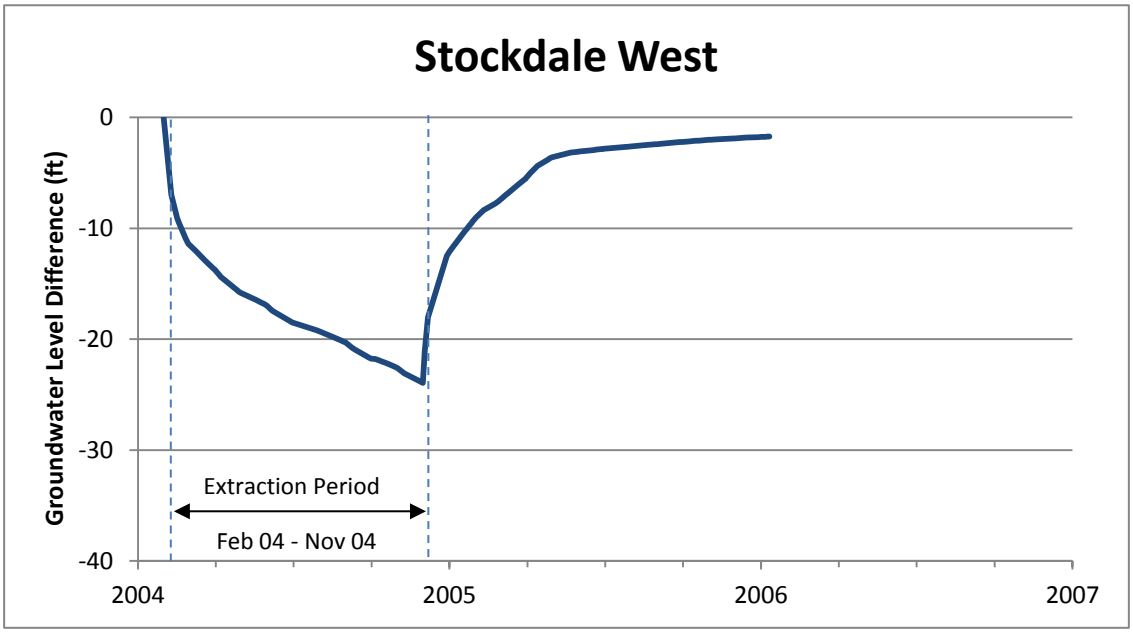
Figure 17



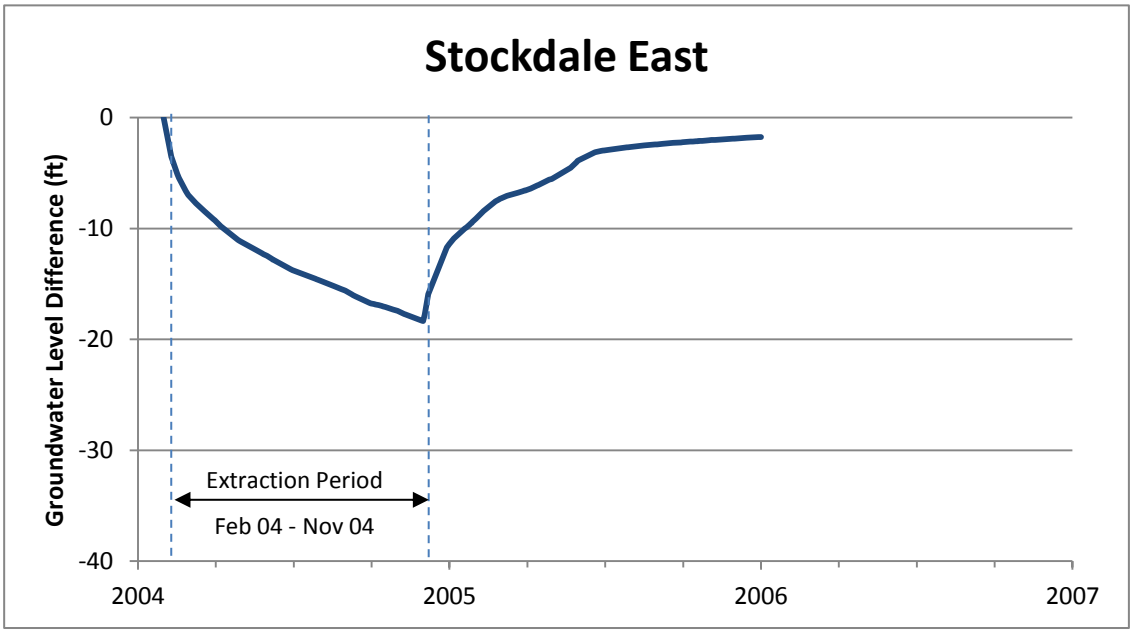
Scenario 2 Maximum Predicted Pumping Drawdown at Nearest Private Wells Deep Aquifer

Figure 18

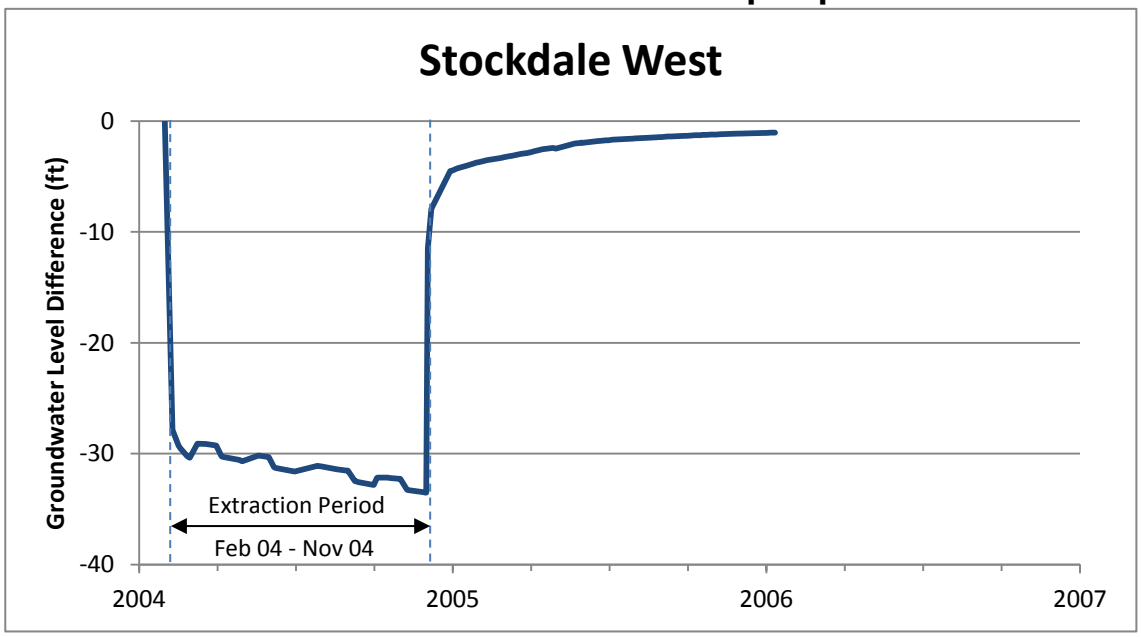
Model-Predicted Groundwater Level Change Over Time Scenario 2 - Groundwater Pumping during Low Groundwater Conditions - Shallow/Intermediate Aquifers



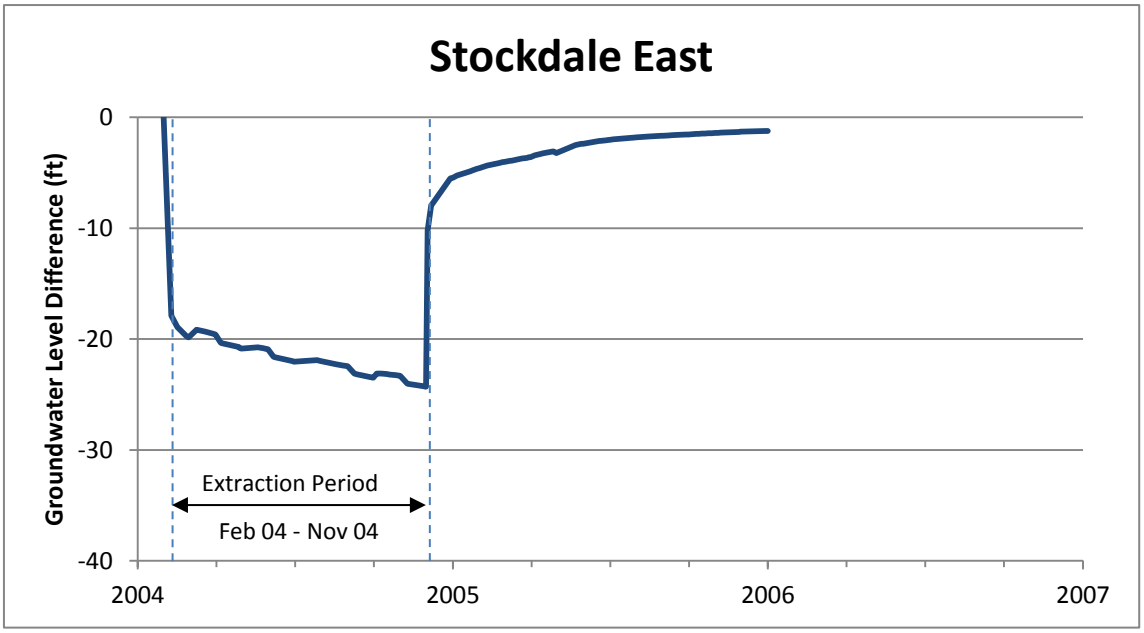
This figure shows the rate that groundwater levels recover following the simulated extraction period from February 2004 to November 2004. As shown, groundwater levels recover to within 5 ft of their pre-extraction level within 6 months after Project pumping stops.



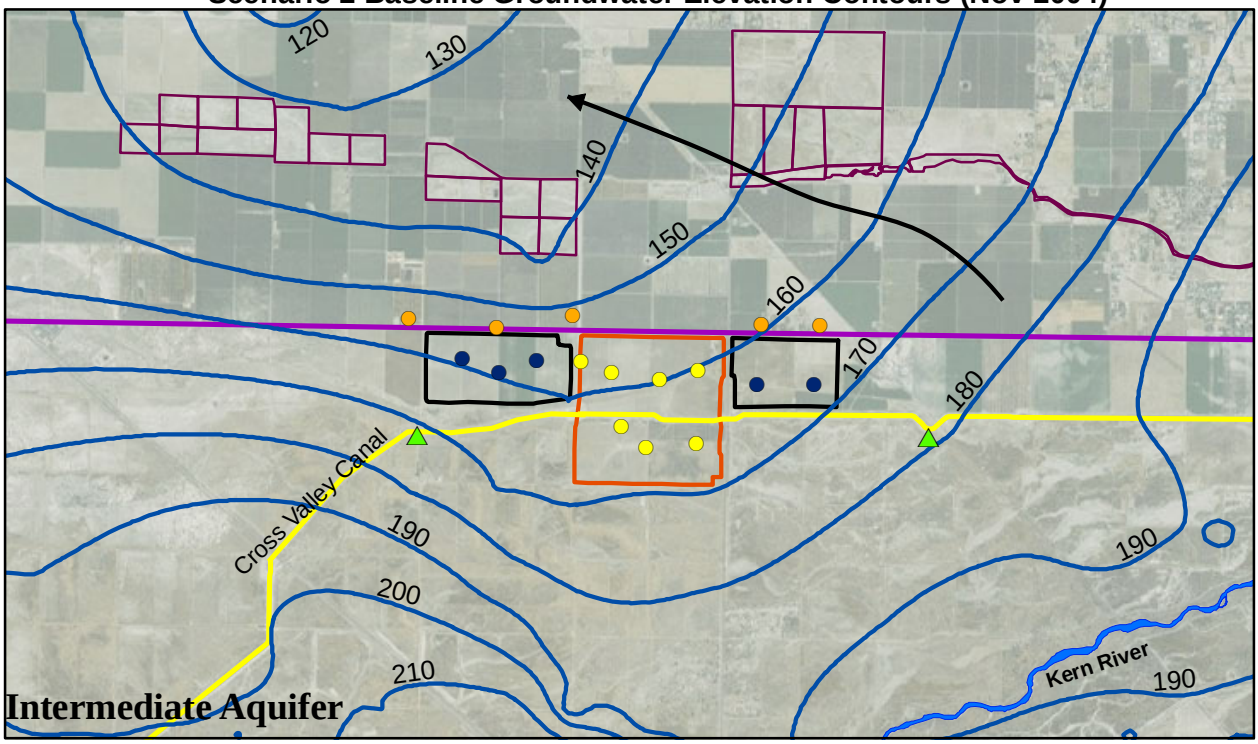
Model-Predicted Groundwater Level Change Over Time
Scenario 2 - Groundwater Pumping during Low Groundwater Conditions - Deep Aquifer



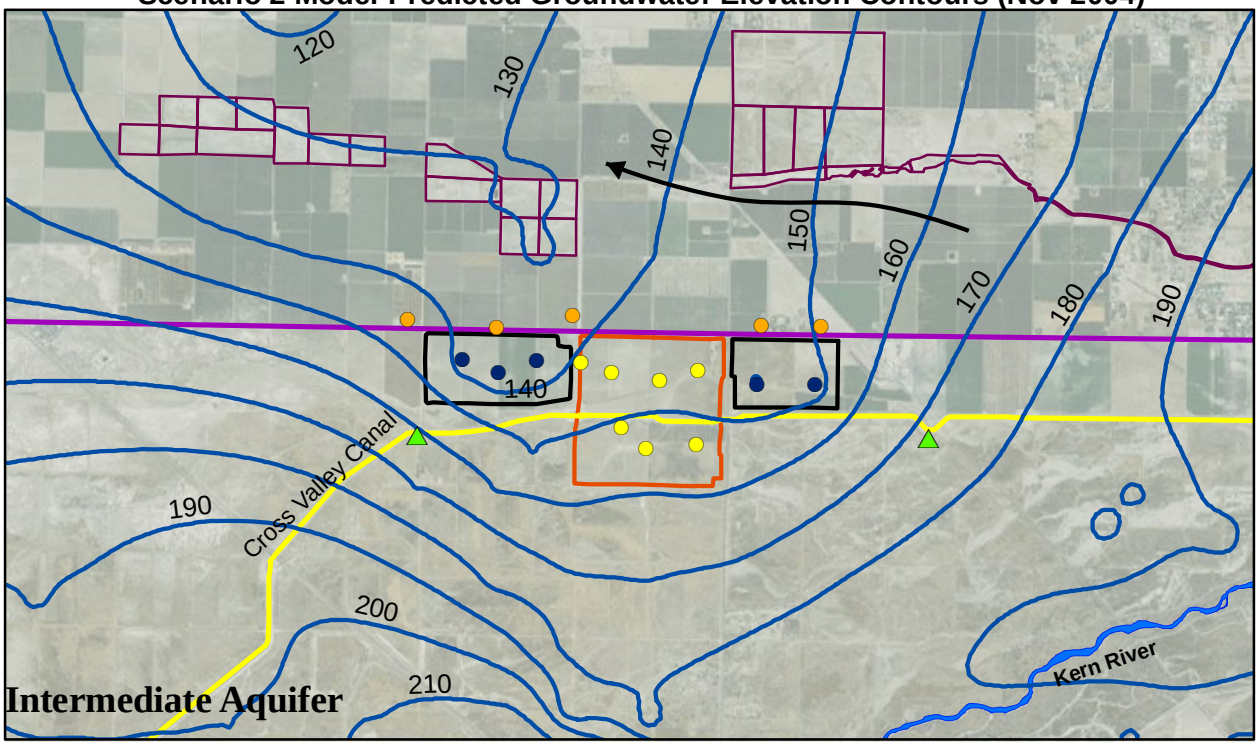
This figure shows the rate that groundwater levels recover following the simulated extraction period from February 2004 to November 2004. As shown, groundwater levels recover to within 5 ft of their pre-extraction level within 6 months after Project pumping stops.



Scenario 2 Baseline Groundwater Elevation Contours (Nov 2004)



Scenario 2 Model-Predicted Groundwater Elevation Contours (Nov 2004)



Groundwater Flow Direction

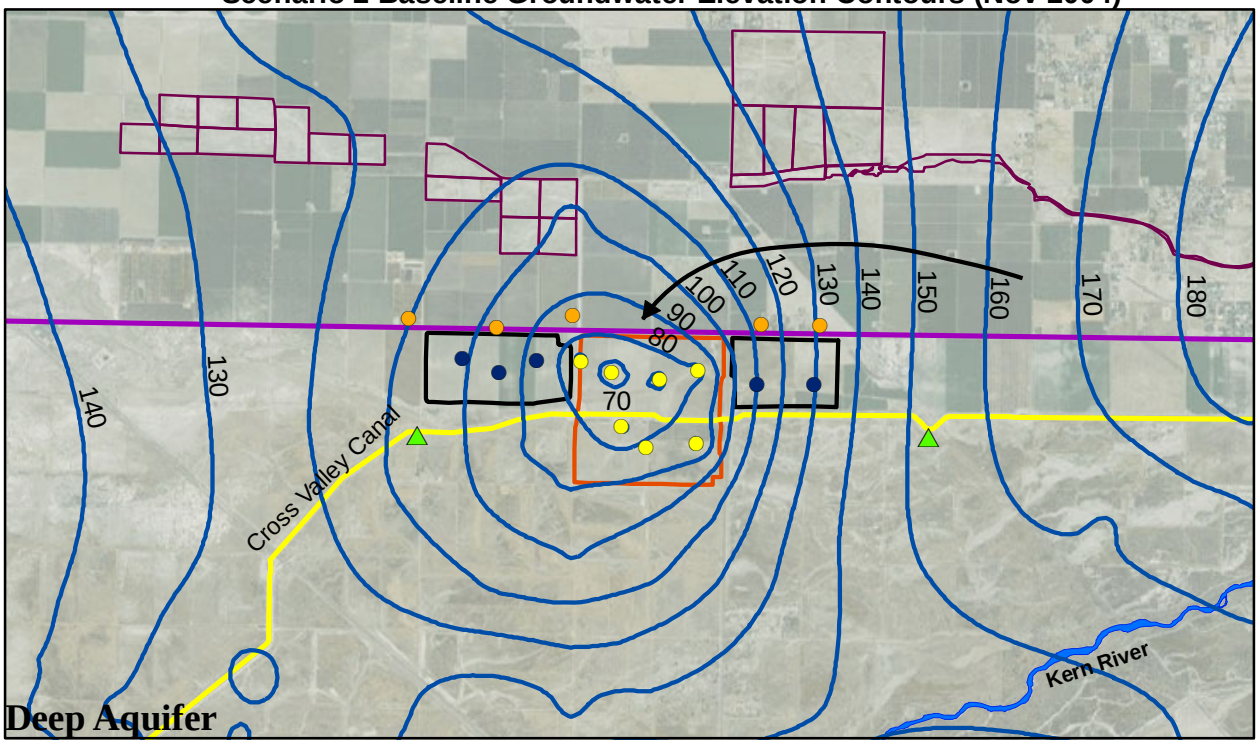
0 0.5 1 2 Miles

NAD 83 State Plane CA Zone 5
Groundwater contours in ft amsl

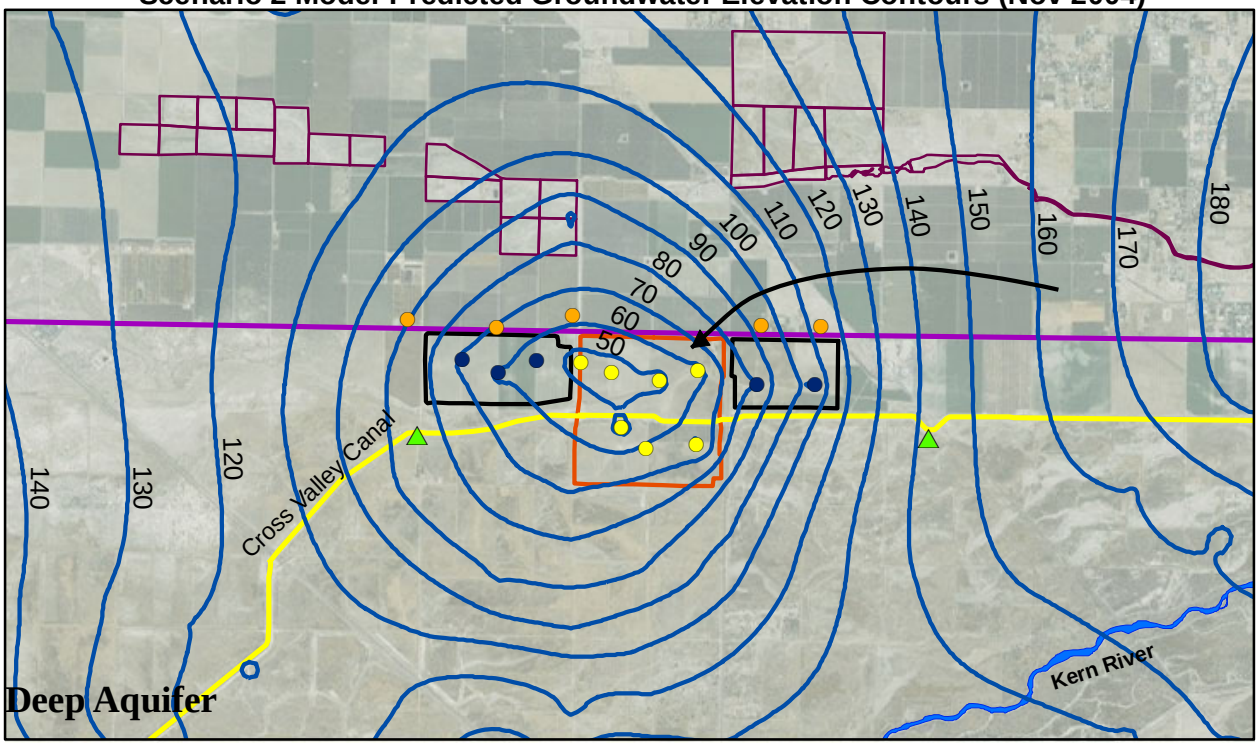
Thomas Harder & Co.
Groundwater Consulting

Figure 21

Scenario 2 Baseline Groundwater Elevation Contours (Nov 2004)



Scenario 2 Model-Predicted Groundwater Elevation Contours (Nov 2004)



Groundwater Flow Direction

0 0.5 1 2 Miles

NAD 83 State Plane CA Zone 5
Groundwater contours in ft amsl

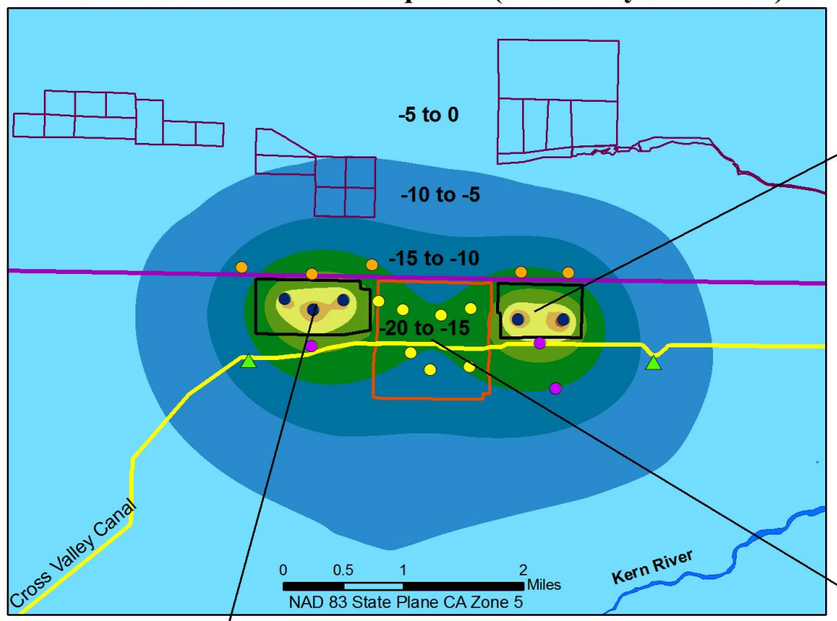
Thomas Harder & Co.
Groundwater Consulting

Figure 22

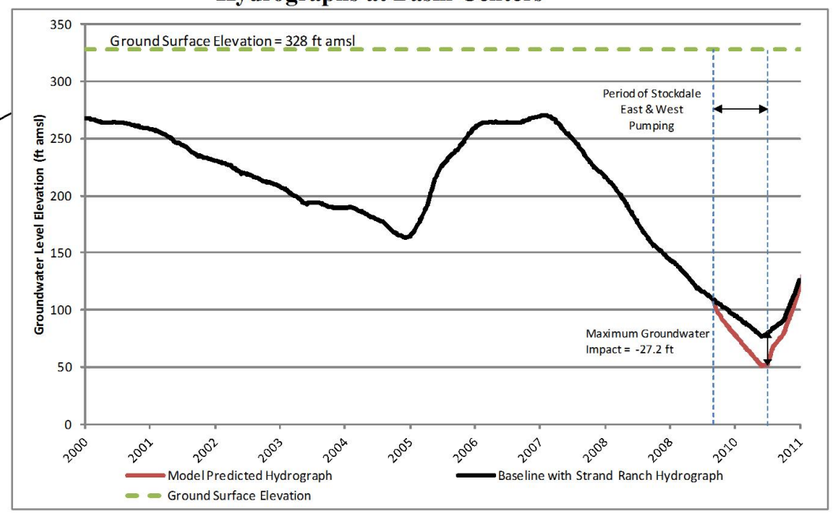
Rosedale-Rio Bravo Water Storage District
Irvine Ranch Water District

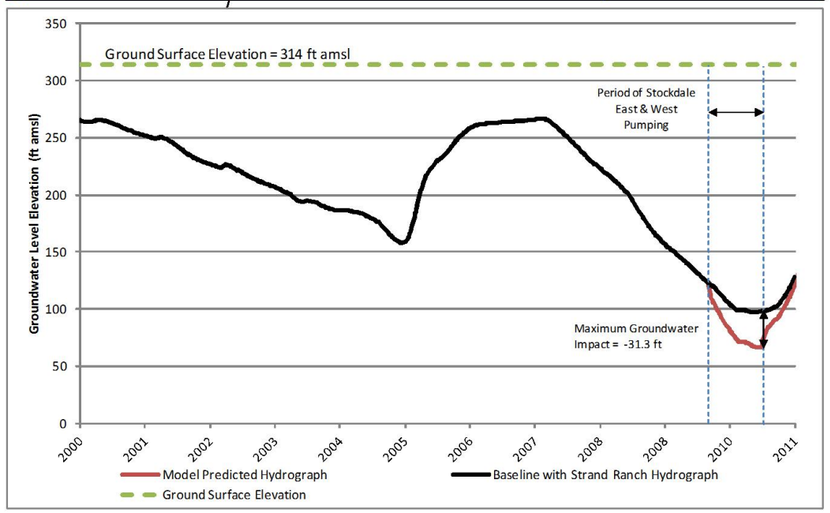
Evaluation of Potential Groundwater Changes Associated with the Proposed Stockdale Integrated Banking Project

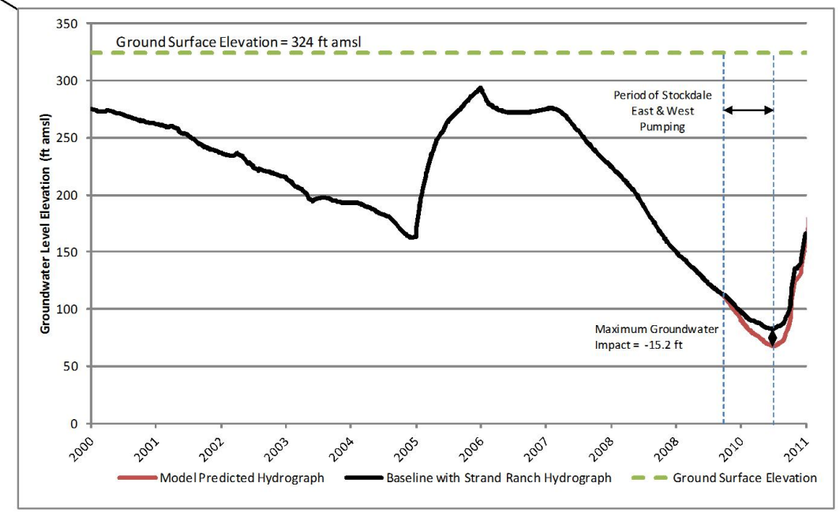
Model-Predicted Pumping Drawdown Relative to Baseline Shallow and Intermediate Aquifers (Model Layers 1 and 2)



Hydrographs at Basin Centers







Map Features

- Groundwater Level Change (ft)
  - -5 to 0
  - -10 to -5
  - -15 to -10
  - -20 to -15
  - -25 to -20
  - -30 to -25
  - -35 to -30
  - -40 to -35
- Preliminary Stockdale Well
- Observation Point
- Private Well
- Monitoring Well
- Strand Ranch Production Well
- Stockdale Recharge Basins
- Strand Ranch Recharge Basin
- Rosedale-Rio Bravo Water Storage District Recharge Basin
- Rosedale-Rio Bravo Water Storage District
- Cross Valley Canal
- Water Course

This figure shows that combined Project pumping during low groundwater level conditions is predicted to result in a maximum drawdown, relative to the hydrologic baseline, of approximately 31 ft beneath Stockdale West and approximately 27 ft beneath Stockdale East. Maximum drawdown at existing wells is expected to range from approximately 16 to 21 ft.

23-Jan-15

Scenario 3 Model-Predicted Pumping Drawdown Relative to Baseline Shallow/Intermediate Aquifers

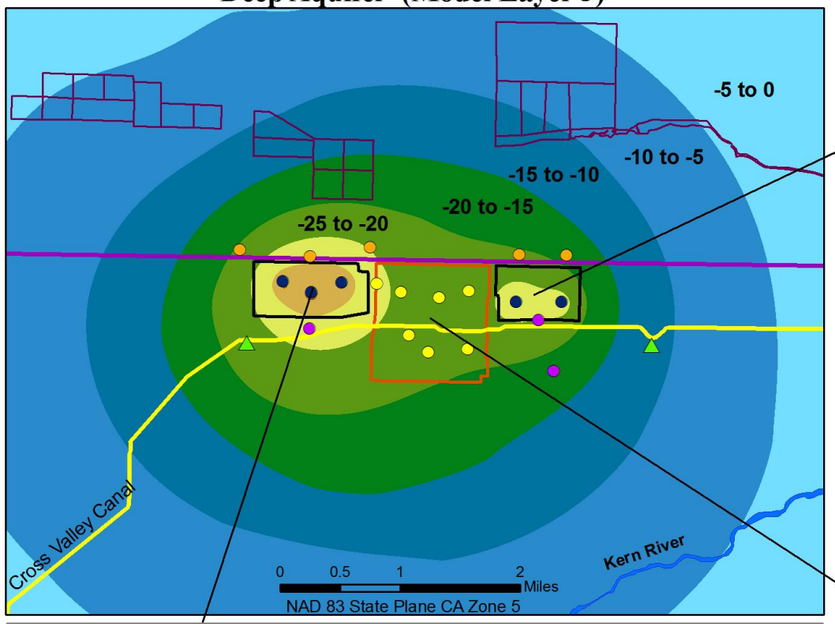
Figure 23

Thomas Harder & Co.
Groundwater Consulting

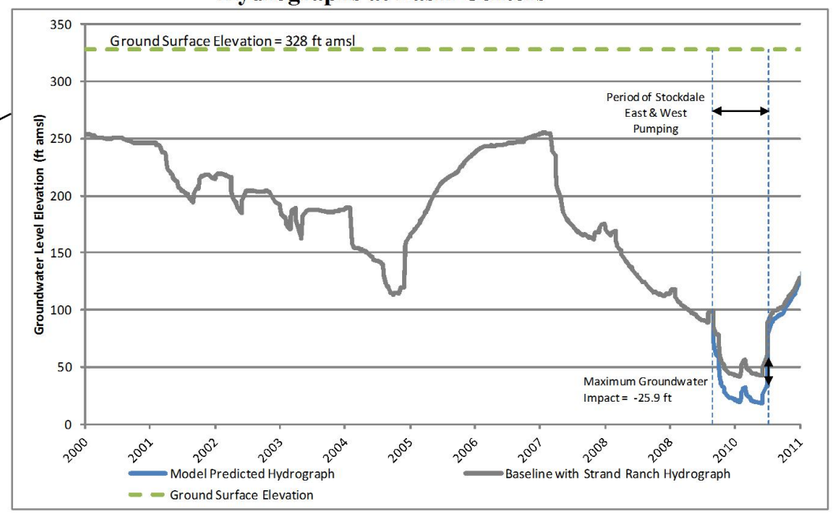
Rosedale-Rio Bravo Water Storage District
Irvine Ranch Water District

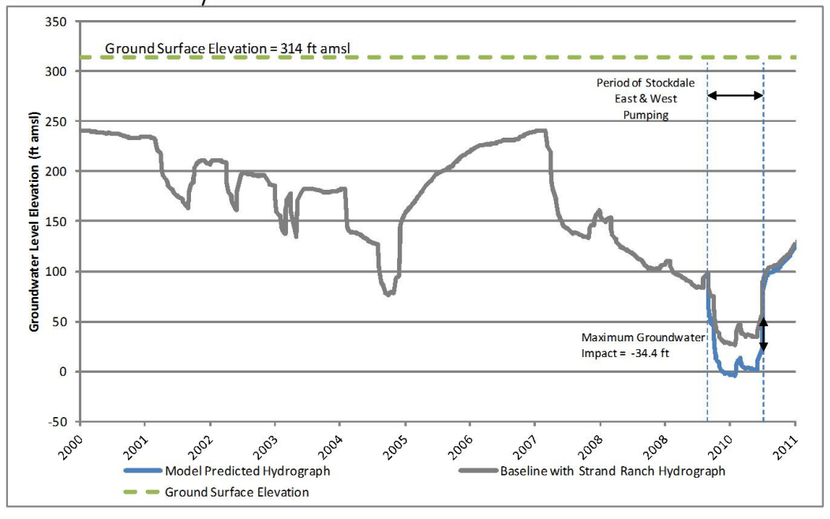
Evaluation of Potential Groundwater Changes Associated with the Proposed Stockdale Integrated Banking Project

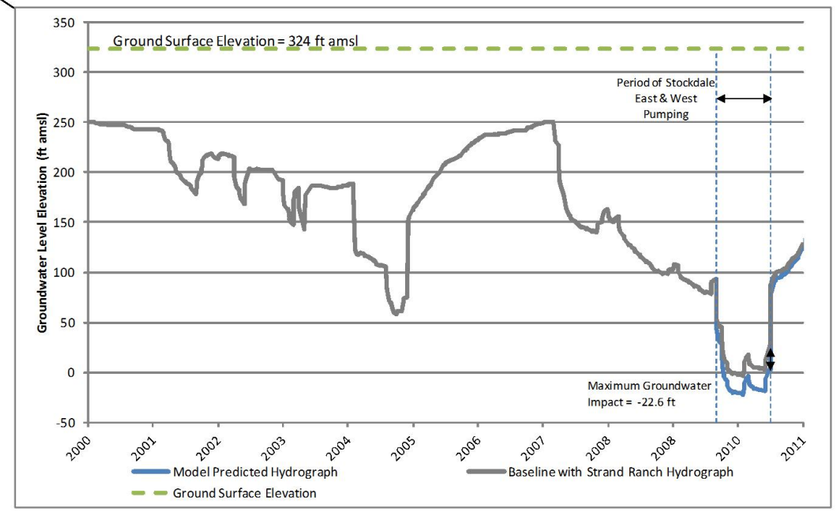
Model-Predicted Pumping Drawdown Relative to Baseline Deep Aquifer (Model Layer 3)



Hydrographs at Basin Centers







Map Features

- Groundwater Level Change (ft)
  - -5 to 0
  - -10 to -5
  - -15 to -10
  - -20 to -15
  - -25 to -20
  - -30 to -25
  - -35 to -30
  - -40 to -35
- Preliminary Stockdale Well
- Observation Point
- Private Well
- Monitoring Well
- Strand Ranch Production Well
- Stockdale Recharge Basin
- Strand Ranch Recharge Basin
- Rosedale-Rio Bravo Water Storage District Recharge Basin
- Rosedale-Rio Bravo Water Storage District
- Cross Valley Canal
- Water Course

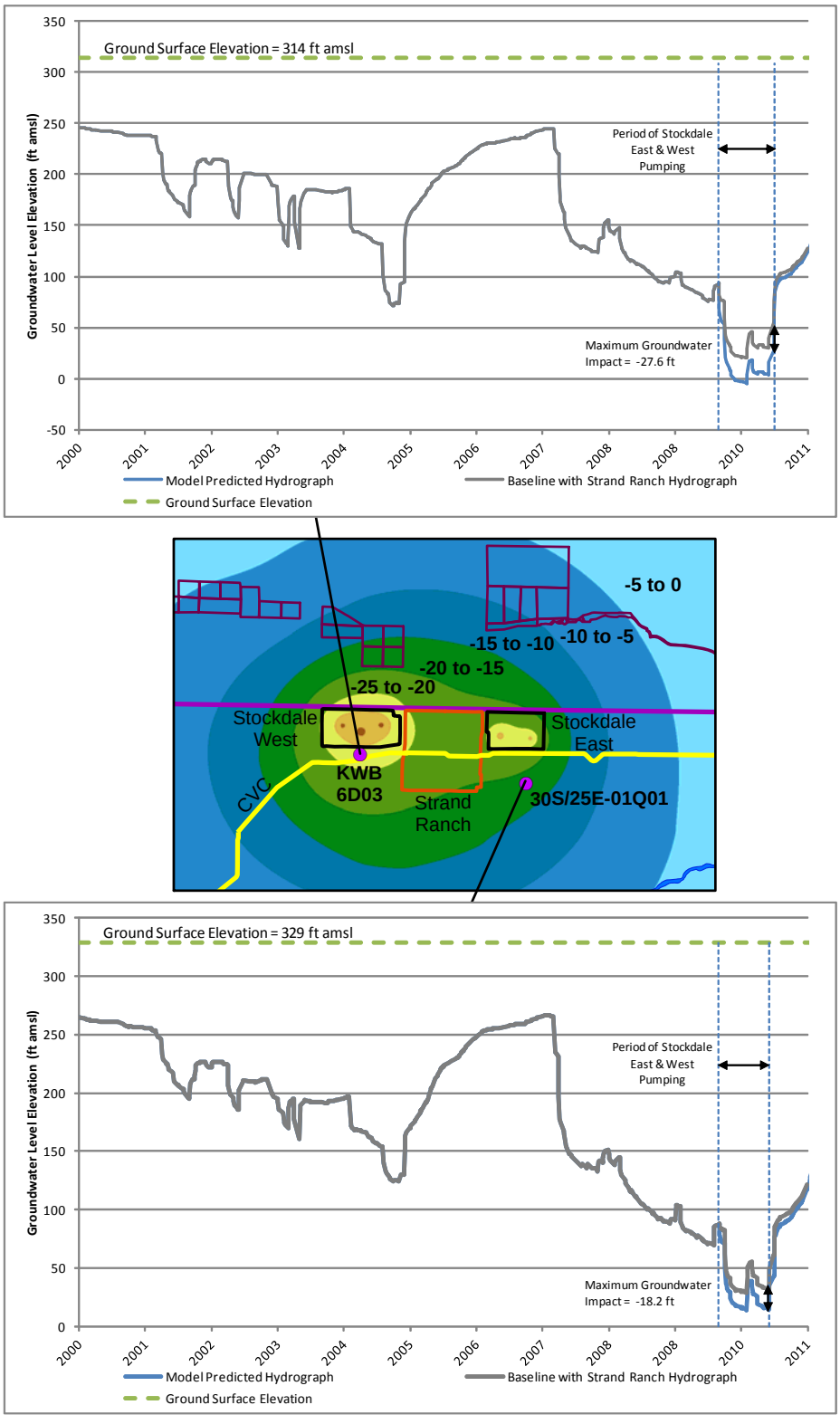
This figure shows that combined Project pumping during low groundwater level conditions is predicted to result in a maximum drawdown, relative to the baseline, of approximately 34 ft beneath Stockdale West and approximately 26 ft beneath Stockdale East. Maximum drawdown at existing wells is expected to range from approximately 21 to 29 ft.

23-Jan-15

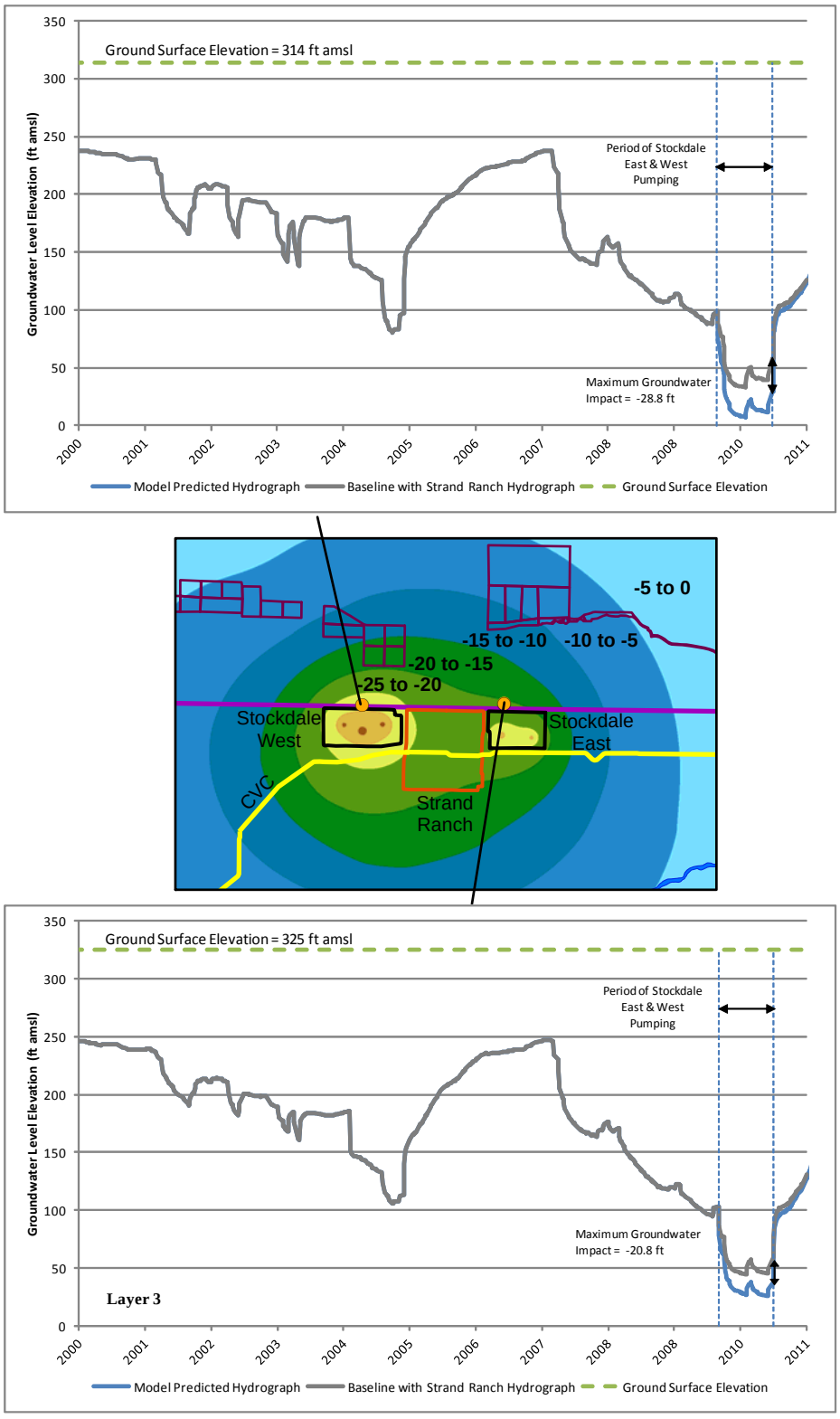
Scenario 3 Model-Predicted Pumping Drawdown Relative to Baseline Deep Aquifer

Figure 24

Thomas Harder & Co.
Groundwater Consulting



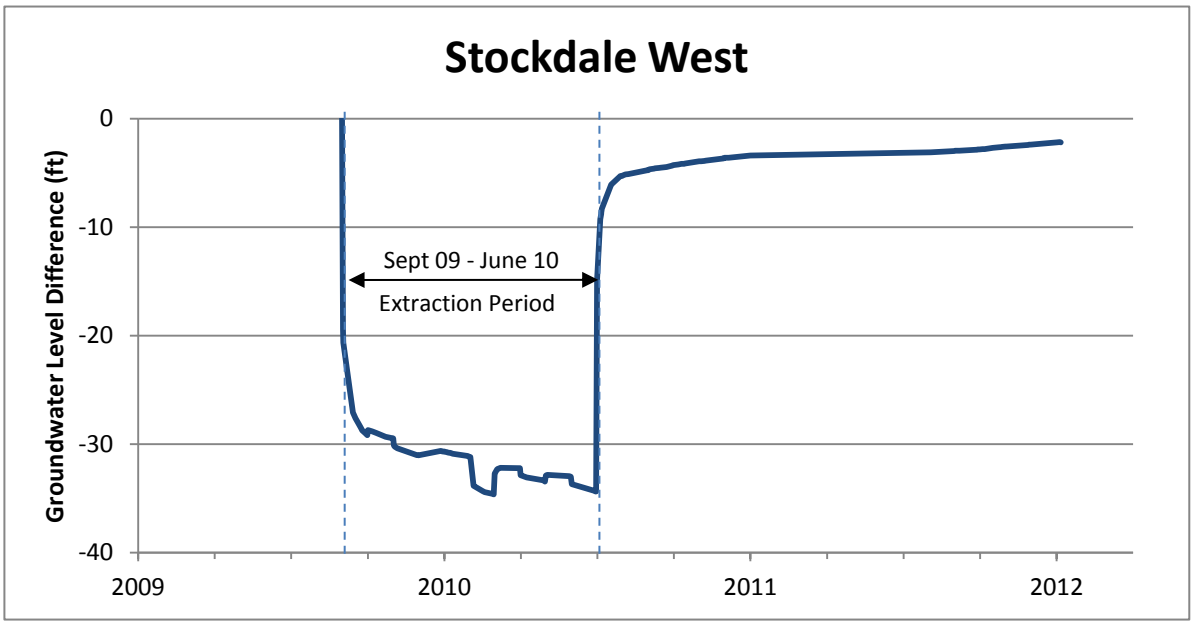
Scenario 3 Maximum Predicted Pumping Drawdown at Nearest Production Wells Deep Aquifer
Figure 25



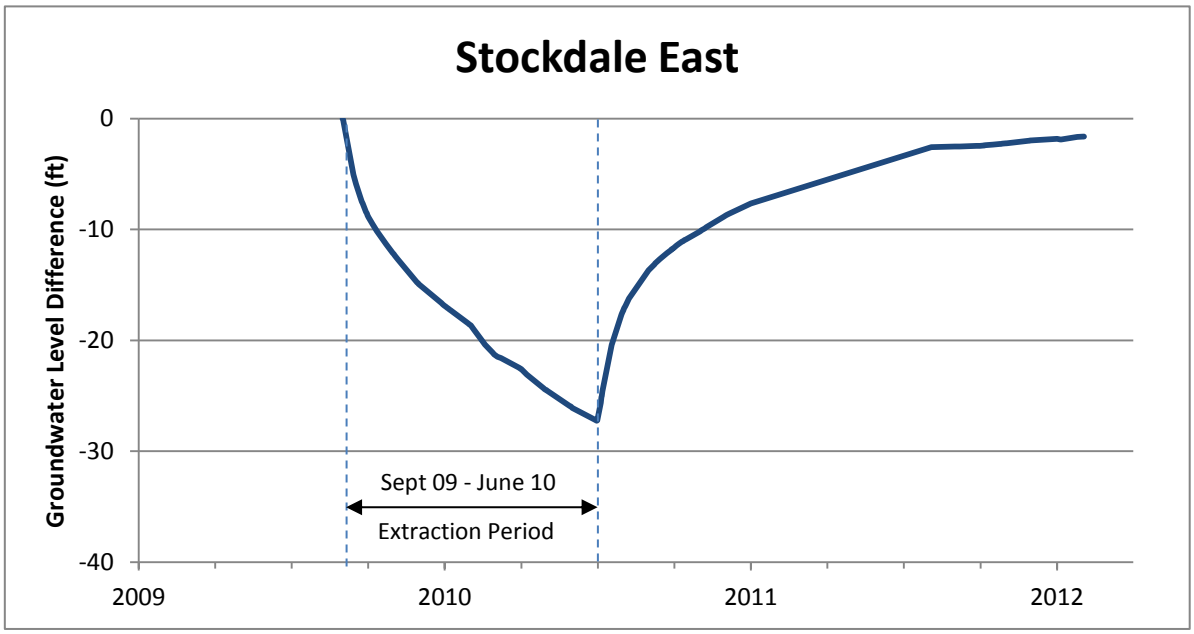
Scenario 3 Maximum Predicted Pumping Drawdown at Nearest Private Wells Deep Aquifer

Figure 26

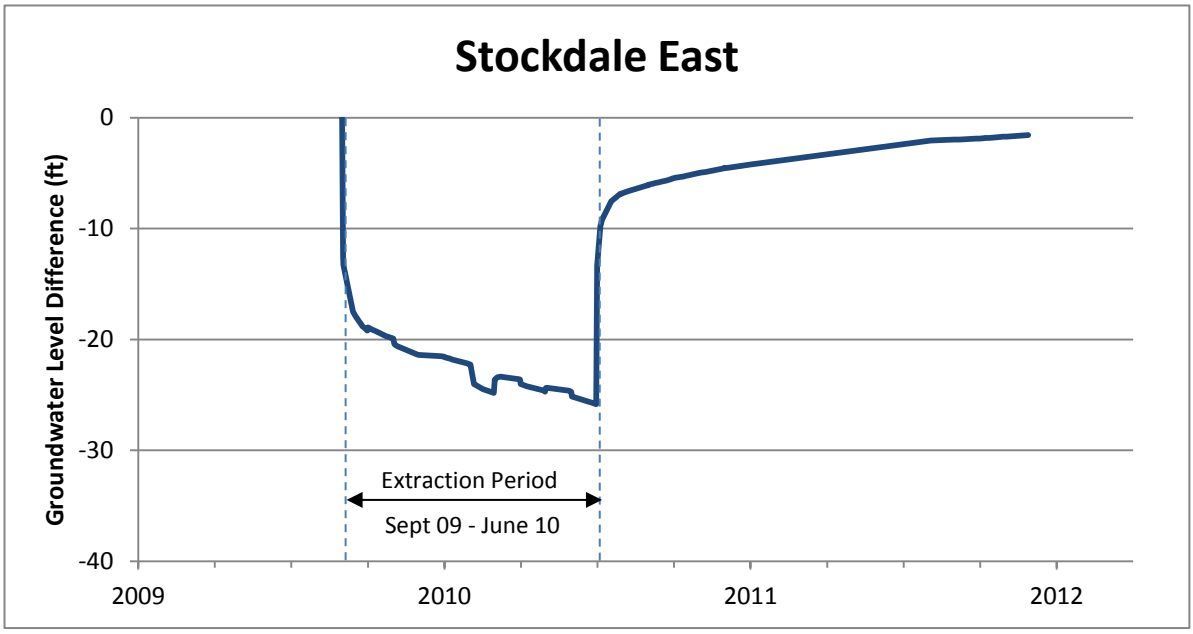
Model-Predicted Groundwater Level Change Over Time Scenario 3 - Pumping during Historical Low Groundwater Conditions - Shallow/Intermediate Aquifers



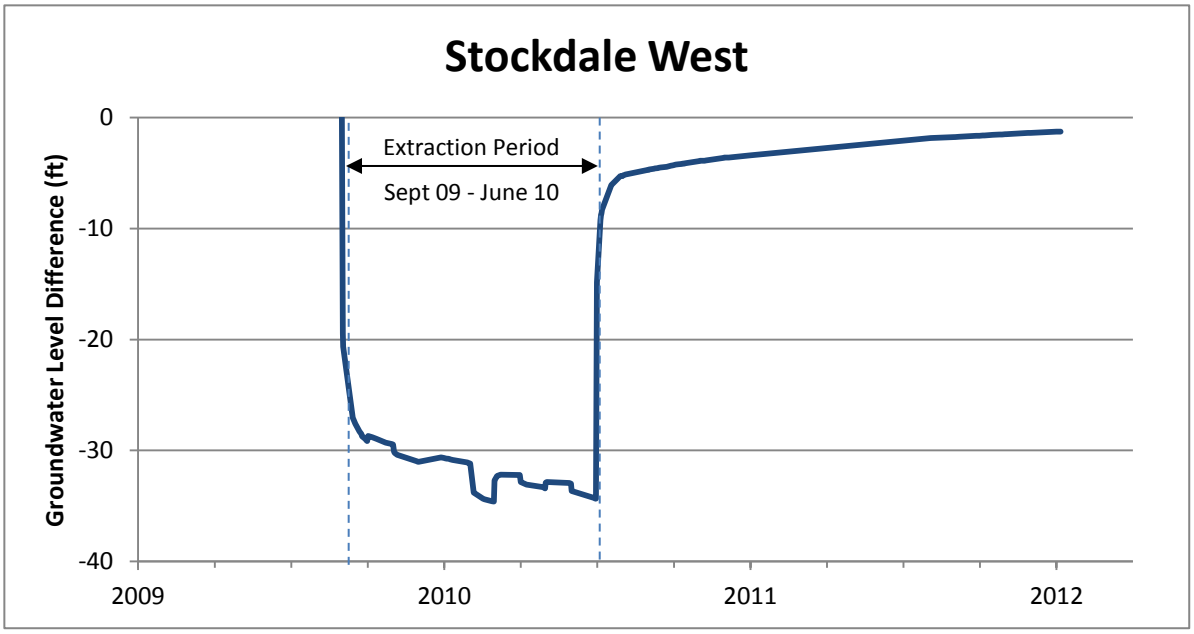
This figure shows the rate that groundwater levels recover following the simulated extraction period from September 2009 to June 2010. As shown, groundwater levels recover to within 10 ft of their pre-extraction level within 6 months after Project pumping stops.



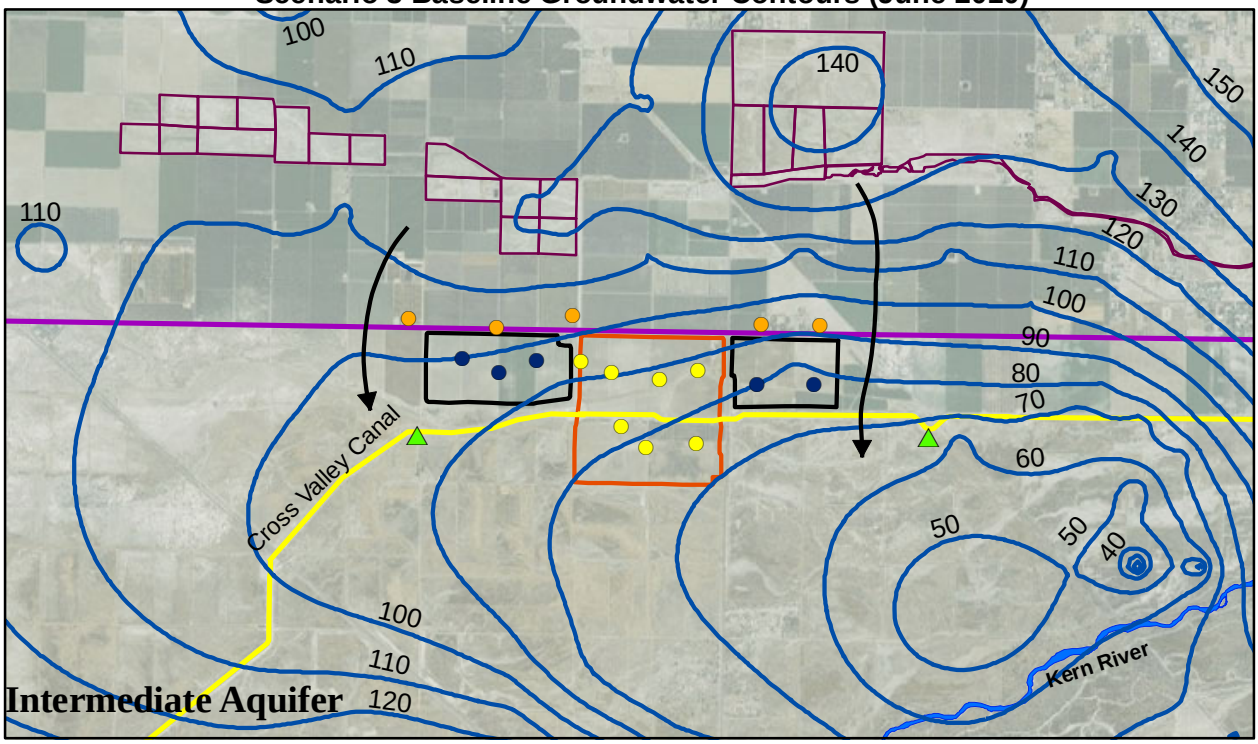
Model-Predicted Groundwater Level Change Over Time
Scenario 3 - Pumping during Historical Low Groundwater Conditions - Deep Aquifer



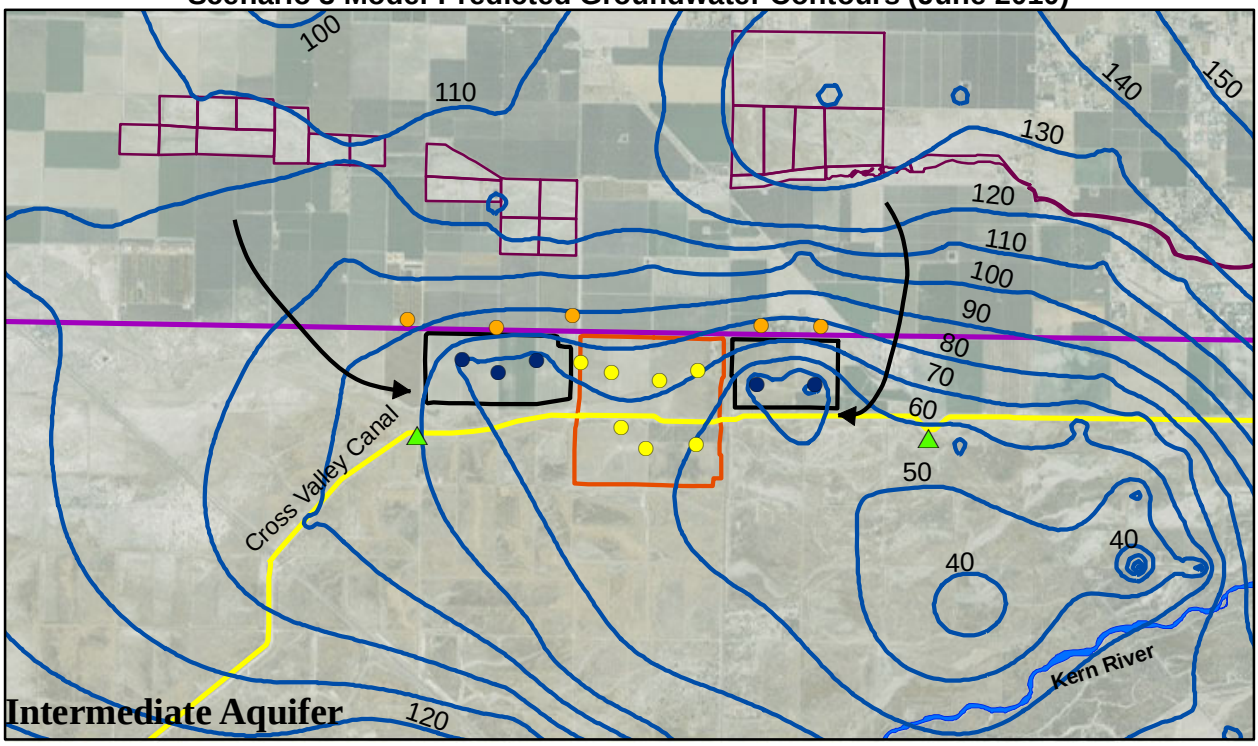
This figure shows the rate that groundwater levels recover following the simulated extraction period from September 2009 to June 2010. As shown, groundwater levels recover to within 5 ft of their pre-extraction level within 6 months after Project pumping stops.



Scenario 3 Baseline Groundwater Contours (June 2010)



Scenario 3 Model-Predicted Groundwater Contours (June 2010)



Groundwater Flow Direction

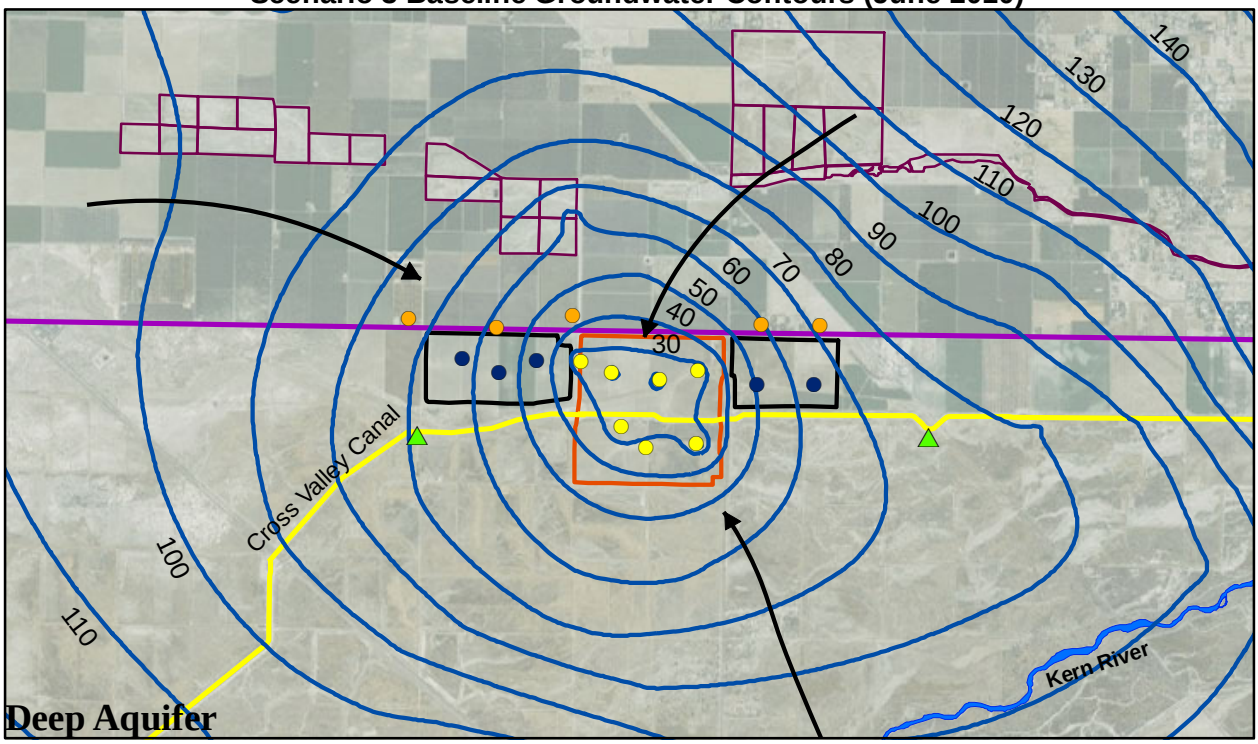
0 0.5 1 2 Miles

NAD 83 State Plane CA Zone 5
Groundwater contours in ft amsl

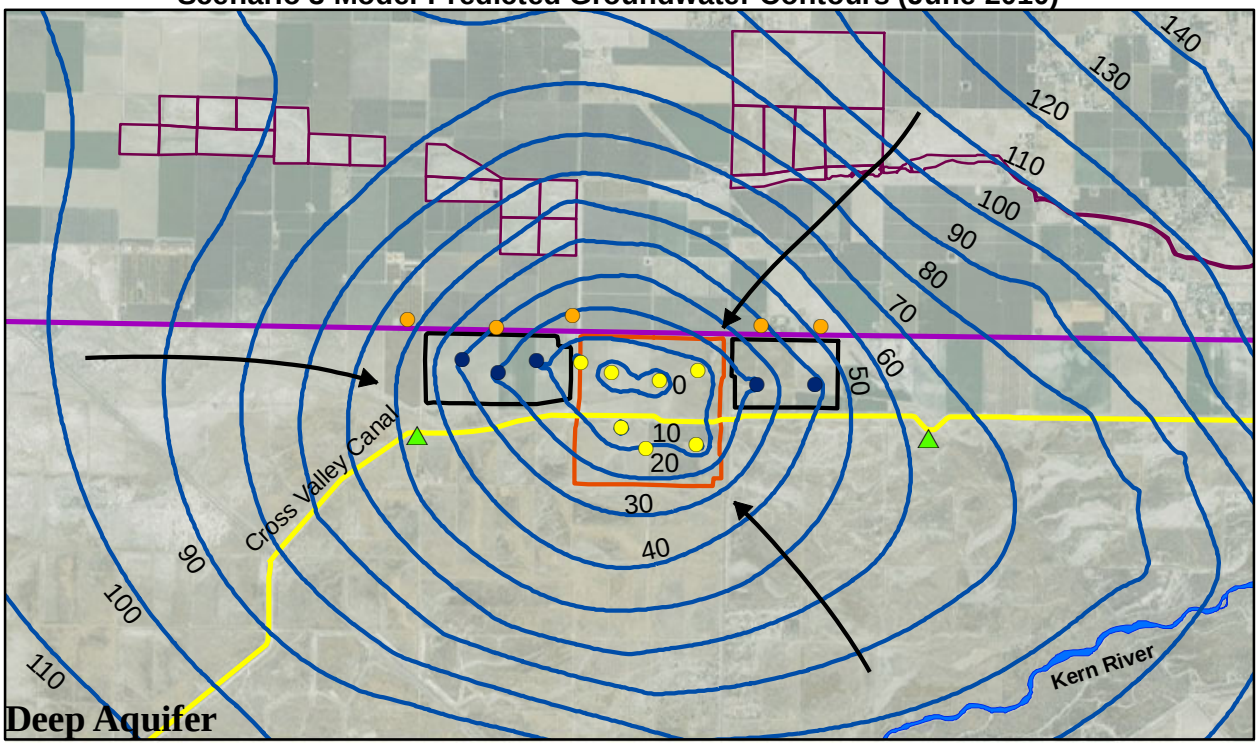
Thomas Harder & Co.
Groundwater Consulting

Figure 29

Scenario 3 Baseline Groundwater Contours (June 2010)



Scenario 3 Model-Predicted Groundwater Contours (June 2010)



Groundwater Flow Direction

0 0.5 1 2 Miles

NAD 83 State Plane CA Zone 5
Groundwater contours in ft amsl

Thomas Harder & Co.
Groundwater Consulting

Figure 30

Appendix

September 17, 2012

Thomas Harder & Co.
801 E. Yorba Linda Blvd.
Suite 3a
Placentia, CA 92870

Subject: Subcontract Analyses for FGL Lab No. SP 1208765

Enclosed please find results for the following sample(s) which were received by FGL.

- Sub Contracted-1,4 Dioxane
- Sub Contracted-EPA 525.2

Please note that this analysis was performed by Weck Laboratories, Inc. (NELAP Certified Laboratory)

Thank you for using FGL Environmental.

Sincerely,

Cindy Aguirre FGL Digitally signed by Cindy Aguirre
Title: Customer Service Rep
Date: 2012-09-17

Enclosure

Certificate of Analysis

Report Date: 09/13/12 16:48
Received Date: 08/30/12 09:40
Turnaround Time: Normal

Project: SP 1208765 - (2-24140)

Phones: (805) 392-2012
Fax: (805) 525-4172

P.O. #:

Attn: Cindy Aquire

Client: FGL Environmental
853 Corporation Street
Santa Paula, CA 93060

Dear Cindy Aquire :

Enclosed are the results of analyses for samples received 8/30/2012 with the Chain of Custody document. The samples were received in good condition, at 3.9 °C and on ice. All analysis met the method criteria except as noted below or in the report with data qualifiers.

Lab Sample ID: 2H30009-01 **Sample ID: Travel Blank** **Matrix:** Water
Sampled by: Andrew Hausheer **Sampled: 08/29/12 00:00**

Analyte	Result	MDL	MRL	Units	Dil	Method	Prepared	Analyzed	Batch	Qualifier
Benzo (a) pyrene	ND		0.10	ug/l	1	EPA 525.2	9/6/12	9/11/12 15:10	W2I0128	
Bis(2-ethylhexyl)adipate	ND		5.0	ug/l	1	EPA 525.2	9/6/12	9/11/12 15:10	W2I0128	
Bis(2-ethylhexyl)phthalate	**7.2**		3.0	ug/l	1	EPA 525.2	9/6/12	9/11/12 15:10	W2I0128	
Surrogate: 1,3-Dimethyl-2-nitrobenzene	*109 %*		*73-136*	%		Concentration: *5.43*				
Surrogate: Perylene-d12	*144 %*		*48-141*	%		Concentration: *7.21*				*S-GC*
Surrogate: Triphenyl phosphate	*122 %*		*71-150*	%		Concentration: *6.08*				

Lab Sample ID: 2H30009-02 **Sample ID: Stockdale West** **Matrix:** Water
Sampled by: Andrew Hausheer **Sampled: 08/29/12 09:30**

Analyte	Result	MDL	MRL	Units	Dil	Method	Prepared	Analyzed	Batch	Qualifier
Benzo (a) pyrene	ND		0.10	ug/l	1	EPA 525.2	9/6/12	9/11/12 15:38	W2I0128	
Bis(2-ethylhexyl)adipate	ND		5.0	ug/l	1	EPA 525.2	9/6/12	9/11/12 15:38	W2I0128	
Bis(2-ethylhexyl)phthalate	ND		3.0	ug/l	1	EPA 525.2	9/6/12	9/11/12 15:38	W2I0128	
Surrogate: 1,3-Dimethyl-2-nitrobenzene	*110 %*		*73-136*	%		Concentration: *5.51*				
Surrogate: Perylene-d12	*118 %*		*48-141*	%		Concentration: *5.92*				
Surrogate: Triphenyl phosphate	*94 %*		*71-150*	%		Concentration: *4.70*				
1,4-Dioxane	ND		0.50	ug/l	1	EPA 8270M	8/31/12	9/5/12 12:22	W2H1348	

Lab Sample ID: 2H30009-03 **Sample ID: Stockdale East** **Matrix:** Water
Sampled by: Andrew Hausheer **Sampled: 08/29/12 10:30**

Analyte	Result	MDL	MRL	Units	Dil	Method	Prepared	Analyzed	Batch	Qualifier
Benzo (a) pyrene	ND		0.10	ug/l	1	EPA 525.2	9/6/12	9/11/12 16:06	W2I0128	
Bis(2-ethylhexyl)adipate	ND		5.0	ug/l	1	EPA 525.2	9/6/12	9/11/12 16:06	W2I0128	
Bis(2-ethylhexyl)phthalate	ND		3.0	ug/l	1	EPA 525.2	9/6/12	9/11/12 16:06	W2I0128	

Weck Laboratories, Inc 14859 East Clark Avenue, City of Industry, California 91745-1396 (626) 336-2139 FAX (626) 336-2634
www.wecklabs.com

Certificate of Analysis

Lab Sample ID: 2H30009-03 **Sample ID:** Stockdale East **Matrix:** Water
Sampled by: Andrew Hausheer **Sampled:** 08/29/12 10:30

Analyte	Result	MDL	MRL	Units	Dil	Method	Prepared	Analyzed	Batch	Qualifier
Surrogate: 1,3-Dimethyl-2-nitrobenzene	*112 %*		*73-136*	%	Concentration: *5.61*					
Surrogate: Perylene-d12	*120 %*		*48-141*	%	Concentration: *6.02*					
Surrogate: Triphenyl phosphate	*101 %*		*71-150*	%	Concentration: *5.03*					
1,4-Dioxane	ND		0.50	ug/l	1	EPA 8270M	8/31/12	9/5/12 12:41	W2H1348	

Weck Laboratories, Inc 14859 East Clark Avenue, City of Industry, California 91745-1396 (626) 336-2139 FAX (626) 336-2634
www.wecklabs.com

Certificate of Analysis

Quality Control Section

1,4-Dioxane Low Level by isotopic dilution GC/MS - Quality Control

Batch W2H1348 - EPA 8270M

Blank (W2H1348-BLK1) **Prepared: 08/31/12 Analyzed: 09/05/12 11:28**

Analyte	Sample Result	QC Result	Qualifier	Units	Spike Level	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		ND		ug/l					

LCS (W2H1348-BS1) **Prepared: 08/31/12 Analyzed: 09/05/12 11:46**

Analyte	Sample Result	QC Result	Qualifier	Units	Spike Level	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		10.1		ug/l	10.0	101	76-131		

LCS Dup (W2H1348-BSD1) **Prepared: 08/31/12 Analyzed: 09/05/12 12:04**

Analyte	Sample Result	QC Result	Qualifier	Units	Spike Level	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		10.0		ug/l	10.0	100	76-131	0.6	30

Semivolatile Organic Compounds by GC/MS - Quality Control

Batch W2I0128 - EPA 525.2

Blank (W2I0128-BLK1) **Prepared: 09/06/12 Analyzed: 09/11/12 11:25**

Analyte	Sample Result	QC Result	Qualifier	Units	Spike Level	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,3-Dimethyl-2-nitrobenzene		*5.40*		ug/l	*5.00*	*108*	*73-136*		
Surrogate: Triphenyl phosphate		*4.80*		ug/l	*5.00*	*96*	*71-150*		
Surrogate: Perylene-d12		*6.28*		ug/l	*5.00*	*126*	*48-141*		
Bis(2-ethylhexyl)phthalate		ND		ug/l					
Bis(2-ethylhexyl)adipate		ND		ug/l					
Benzo (a) pyrene		ND		ug/l					

LCS (W2I0128-BS1) **Prepared: 09/06/12 Analyzed: 09/11/12 11:53**

Analyte	Sample Result	QC Result	Qualifier	Units	Spike Level	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,3-Dimethyl-2-nitrobenzene		*5.38*		ug/l	*5.00*	*108*	*73-136*		
Surrogate: Triphenyl phosphate		*4.97*		ug/l	*5.00*	*99*	*71-150*		
Surrogate: Perylene-d12		*6.08*		ug/l	*5.00*	*122*	*48-141*		
Bis(2-ethylhexyl)phthalate		4.06		ug/l	5.00	81	54-142		
Bis(2-ethylhexyl)adipate		3.71		ug/l	5.00	74	50-145		
Benzo (a) pyrene		4.44		ug/l	5.00	89	54-136		

LCS Dup (W2I0128-BSD1) **Prepared: 09/06/12 Analyzed: 09/11/12 12:21**

Analyte	Sample Result	QC Result	Qualifier	Units	Spike Level	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,3-Dimethyl-2-nitrobenzene		*5.69*		ug/l	*5.00*	*114*	*73-136*		
Surrogate: Triphenyl phosphate		*4.55*		ug/l	*5.00*	*91*	*71-150*		
Surrogate: Perylene-d12		*6.46*		ug/l	*5.00*	*129*	*48-141*		
Bis(2-ethylhexyl)phthalate		4.48		ug/l	5.00	90	54-142	10	30
Bis(2-ethylhexyl)adipate		3.54		ug/l	5.00	71	50-145	5	30
Benzo (a) pyrene		4.27		ug/l	5.00	85	54-136	4	30

Weck Laboratories, Inc 14859 East Clark Avenue, City of Industry, California 91745-1396 (626) 336-2139 FAX (626) 336-2634
www.wecklabs.com

Certificate of Analysis

Notes:
The Chain of Custody document is part of the analytical report.
Any remaining sample(s) for testing will be disposed of one month from the final report date unless other arrangements are made in advance.
All results are expressed on wet weight basis unless otherwise specified.

An Absence of Total Coliform meets the drinking water standards as established by the State of California Department of Health Services.
The Reporting Limit (RL) is referenced as laboratory's Practical Quantitation Limit (PQL).
For Potable water analysis, the Reporting Limit (RL) is referenced as Detection Limit for reporting purposes (DLRs) defined by EPA.

If sample collected by Weck Laboratories, sampled in accordance to lab SOP MIS002

Authorized Signature

Contact: Kim G Tu (Project Manager)

ELAP # 1132
LACSD # 10143
NELAC # 04229CA

The results in this report apply to the samples analyzed in accordance with the chain of custody document. Weck Laboratories certifies that the test results meet all requirements of NELAC unless noted in the Case Narrative. This analytical report must be reproduced in its entirety.

Flags for Data Qualifiers:

S-GC	Surrogate recovery outside of control limits due to a possible matrix effect. The data was accepted based on valid recovery of the remaining surrogate.
ND	NOT DETECTED at or above the Reporting Limit. If J-value reported, then NOT DETECTED at or above the Method Detection Limit (MDL).
Sub	Subcontracted analysis, original report enclosed.
DL	Method Detection Limit
RL	Method Reporting Limit
MDA	Minimum Detectable Activity
NR	Not Reportable

Weck Laboratories, Inc 14859 East Clark Avenue, City of Industry, California 91745-1396 (626) 336-2139 FAX (626) 336-2634
www.wecklabs.com

Weck Laboratories, Inc.
Environmental and Analytical Services - Since 1964

Sample Receipt Acknowledgement

WORK ORDER: 2H30009

Printed: 8/31/2012 11:38:57AM

Client: FGL Environmental
Project: 525.2

Project Manager: Kim G Tu
Project Number: SP 1208765 - (2-24140)

Report To:
FGL Environmental
Cindy Aquire
853 Corporation Street
Santa Paula, CA 93060
Phone: (805) 392-2012
Fax: (805) 525-4172

Invoice To:
FGL Environmental
Accounts Payable
853 Corporation Street
Santa Paula, CA 93060
Phone :(805) 392-2000
Fax: (805) 525-4172

Date Due: **09/14/12 15:00 (10 day TAT)**

Received By: Stephanie J Gochez
Date Received: 08/30/12 09:40
Logged In By: Stephanie J Gochez
Date Logged In: 08/30/12 10:29

Samples Received at:	**3.9°C**	All containers intact:	**Yes**	Chain of custody completed:	**Yes**
Number of Ice chests/packages:	**1**	Custody seals presen	**NA**	Sample labels & COC agree:	**Yes**
		Custody seals intact:	**NA**	Samples preserved properly:	**Yes**
Appropriate Sample Containers:	**Yes**	Samples received on ice	**Yes**	Sample volume sufficient:	**Yes**
		Custody Seals	**No**	Sufficient holding time for all tests:	**Yes**

Analysis	TAT	Expires	Comments
2H30009-01 Travel Blank [Water] Sampled 08/29/12 00:00 Pacific			
525.2 Regulated	10	09/12/12 00:00	
2H30009-02 Stockdale West [Water] Sampled 08/29/12 09:30 Pacific			
525.2 Regulated	10	09/12/12 09:30	
1,4-Dioxane_w	10	09/05/12 09:30	
2H30009-03 Stockdale East [Water] Sampled 08/29/12 10:30 Pacific			
525.2 Regulated	10	09/12/12 10:30	
1,4-Dioxane_w	10	09/05/12 10:30	

Comments:

Authorized Signature

8/31/2012
Date

14859 East Clark Avenue, City of Industry, California 91745-1396 (626) 336-2139 FAX (626) 336-2634
www.wecklabs.com

Sample Receipt Acknowledgement

WORK ORDER:	2H30009	Printed: 8/31/2012 11:38:57AM	
Client:	FGL Environmental	Project Manager:	Kim G Tu
Project:	525.2	Project Number:	SP 1208765 - (2-24140)

Note:
If any of the information included in this sample receipt acknowledgement is incorrect (sample information, analysis, etc), please contact the lab at (626) 336-2139. Thank you.

14859 East Clark Avenue, City of Industry, California 91745-1396 (626) 336-2139 FAX (626) 336-2634
www.wecklabs.com

Subcontract to
Weck Laboratories, Inc.

2H30009

Map Ref.

Client: **Fruit Growers Laboratory, Inc.**

Address: FGL Environmental, Inc.
853 Corporation St.
Santa Paula, CA 93060-3005

Phone: (805)392-2039 Fax: (805)525-6264

Contact Person:

Project Name: **SP 1208765 - (2-24140)**

Purchase Order Number:

Sampler(s) Andrew Hausheer

Compositor Setup Date: ____/____/____ Time: ____/____

Lab Number:

Samp Num	Location Description	Date Sampled	Time Sampled	Method of Sampling: Composite(C) Grab(G)	Type of Sample **SEE REVERSE SIDE**	Potable(P) Non-Potable(NP) Ag Water(AgW)	Bacti Type: Other(O) System(SYS) Source(SR) Waste(W)	Bacti Reason: Routine(ROUT) Repeat(RPT) Replace(RPL) Other(O) Special(SPL)	Sub Contracted-EPA 525.2 1000m(AGT)	Sub Contracted-1,4 Dioxane 1000ml(AGJ)								
0	Travel Blank	08/29/12	00:00	G	LBW				1									
1	Stockdale West	08/29/12	09:30	G	GW				1	1								
2	Stockdale East	08/29/12	10:30	G	GW				1	1								

Remarks:

Relinquished	Date:	Time:	Relinquished	Date:	Time:	Relinquished	Date:	Time:
BA	8/29/12	17:30	Ontrac					
Received By:	**Date:**	**Time:**	**Received By:**	**Date:**	**Time:**	**Received By:**	**Date:**	**Time:**
Ontrac			[signature]	8.30.12	9:40			

3.9.C

September 17, 2012

Thomas Harder & Co.
801 E. Yorba Linda Blvd.
Suite 3a
Placentia, CA 92870

Subject: Subcontract Analysis for FGL Lab No. SP 1208765

Enclosed please find results for the following sample(s) which were received by FGL.

- Dioxin-Dioxin EPA 1613B (2,3,7,8 TCDD Only)

Please note that this analysis was performed by Test America Sacramento (NELAP Certified Laboratory)

Thank you for using FGL Environmental.

Sincerely,

Cindy Aguirre Digitally signed by Cindy Aguirre
Title: Customer Service Rep
Date: 2012-09-17

Enclosure

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica West Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

TestAmerica Job ID: G2H310438
Client Project/Site: SP 1208765-(2-24140)

For:
FGL Environmental
853 Corporation Street
P.O. Box 272
Santa Paula, CA 93060-0272

Attn: Cindy Aguirre

Authorized for release by:
9/17/2012 10:54:55 AM

David Alltucker
Project Manager
david.alltucker@testamericainc.com

Table of Contents

Cover Page 1
Table of Contents 2
Definitions/Glossary 3
Case Narrative 4
Detection Summary 5
Client Sample Results 6
Surrogate Summary 7
Internal Standard Summary 8
QC Sample Results 9
QC Association Summary 10
Lab Chronicle 11
Certification Summary 12
Method Summary 13
Sample Summary 14
Chain of Custody 15

Client: FGL Environmental
Project/Site: SP 1208765-(2-24140)

TestAmerica Job ID: G2H310438

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DL, RA, RE, IN	Indicates a Dilution, Reanalysis, Re-extraction, or additional Initial metals/anion analysis of the sample
EDL	Estimated Detection Limit
EPA	United States Environmental Protection Agency
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RL	Reporting Limit
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

TestAmerica West Sacramento Project Number G2H310438

There are no anomalies associated with this project.

Detection Summary

Client: FGL Environmental
Project/Site: SP 1208765-(2-24140)

TestAmerica Job ID: G2H310438

Client Sample ID: STOCKDALE WEST **Lab Sample ID: G2H310438001**

No Detections

Client Sample ID: STOCKDALE EAST **Lab Sample ID: G2H310438002**

No Detections

Client: FGL Environmental
Project/Site: SP 1208765-(2-24140)

TestAmerica Job ID: G2H310438

Client Sample ID: STOCKDALE WEST

Lab Sample ID: G2H310438001

Date Collected: 08/29/12 09:30
Matrix: Water
Date Received: 08/31/12 09:10

Method: 1613B-Tetras - Dioxins/Furans, HRGC/HRMS (1613B-Tetras Only)

Analyte	Result	Qualifier	ML	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	ND		9.9	9.2	pg/L		09/06/12 09:00	09/11/12 16:14	0.99

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*116*		*42 - 164*	*09/06/12 09:00*	*09/11/12 16:14*	*0.99*

Internal Standard	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*71*		*31 - 137*	*09/06/12 09:00*	*09/11/12 16:14*	*0.99*

Client Sample ID: STOCKDALE EAST

Lab Sample ID: G2H310438002

Date Collected: 08/29/12 10:30
Matrix: Water
Date Received: 08/31/12 09:10

Method: 1613B-Tetras - Dioxins/Furans, HRGC/HRMS (1613B-Tetras Only)

Analyte	Result	Qualifier	ML	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	ND		10	3.7	pg/L		09/06/12 09:00	09/11/12 16:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*116*		*42 - 164*	*09/06/12 09:00*	*09/11/12 16:51*	*1*

Internal Standard	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*60*		*31 - 137*	*09/06/12 09:00*	*09/11/12 16:51*	*1*

Surrogate Summary

Client: FGL Environmental
Project/Site: SP 1208765-(2-24140)

TestAmerica Job ID: G2H310438

Method: 1613B-Tetras - Dioxins/Furans, HRGC/HRMS (1613B-Tetras Only)

Matrix: Water **Prep Type: Total**

		Percent Surrogate Recovery (Acceptance Limits)								
Lab Sample ID	Client Sample ID	37TCDD (42-164)								
G2H310438001	STOCKDALE WEST	116								
G2H310438002	STOCKDALE EAST	116								
G2I050000100B	Method Blank	116								

Surrogate Legend

37TCDD = 37Cl4-2,3,7,8-TCDD

Method: 1613B-Tetras - Dioxins/Furans, HRGC/HRMS (1613B-Tetras Only)

Matrix: Water **Prep Type: Total**

		Percent Surrogate Recovery (Acceptance Limits)								
Lab Sample ID	Client Sample ID	37TCDD (37-158)								
G2I050000100C	Lab Control Sample	115								

Surrogate Legend

37TCDD = 37Cl4-2,3,7,8-TCDD

Internal Standards Summary

Client: FGL Environmental
Project/Site: SP 1208765-(2-24140)

TestAmerica Job ID: G2H310438

Method: 1613B-Tetras - Dioxins/Furans, HRGC/HRMS (1613B-Tetras Only)

Matrix: Water **Prep Type: Total**

		Percent Internal Standard Recovery (Acceptance Limits)							
		TCDD							
Lab Sample ID	Client Sample ID	(31-137)							
G2H310438001	STOCKDALE WEST	71							
G2H310438002	STOCKDALE EAST	60							
G2I050000100B	Method Blank	69							

Internal Standard Legend

TCDD = 13C-2,3,7,8-TCDD

Method: 1613B-Tetras - Dioxins/Furans, HRGC/HRMS (1613B-Tetras Only)

Matrix: Water **Prep Type: Total**

		Percent Internal Standard Recovery (Acceptance Limits)							
		TCDD							
Lab Sample ID	Client Sample ID	(25-141)							
G2I050000100C	Lab Control Sample	72							

Internal Standard Legend

TCDD = 13C-2,3,7,8-TCDD

Client: FGL Environmental
Project/Site: SP 1208765-(2-24140)

TestAmerica Job ID: G2H310438

Method: 1613B-Tetras - Dioxins/Furans, HRGC/HRMS (1613B-Tetras Only)

Lab Sample ID: G2I050000100B
Matrix: Water
Analysis Batch: 2249100

Client Sample ID: Method Blank
Prep Type: Total
Prep Batch: 2249100_P

Analyte	MB Result	MB Qualifier	ML	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	ND		10	2.8	pg/L		09/06/12 09:00	09/12/12 10:23	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*116*		*42 - 164*	*09/06/12 09:00*	*09/12/12 10:23*	*1*

Internal Standard	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*69*		*31 - 137*	*09/06/12 09:00*	*09/12/12 10:23*	*1*

Lab Sample ID: G2I050000100C
Matrix: Water
Analysis Batch: 2249100

Client Sample ID: Lab Control Sample
Prep Type: Total
Prep Batch: 2249100_P

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
2,3,7,8-TCDD			200	253		pg/L		126	73 - 146		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
37Cl4-2,3,7,8-TCDD	*115*		*37 - 158*

Internal Standard	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C-2,3,7,8-TCDD	*72*		*25 - 141*

QC Association Summary

Client: FGL Environmental
Project/Site: SP 1208765-(2-24140)

TestAmerica Job ID: G2H310438

Specialty Organics

Analysis Batch: 2249100

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
G2H310438001	STOCKDALE WEST	Total	Water	1613B-Tetras	
G2H310438002	STOCKDALE EAST	Total	Water	1613B-Tetras	
G2I050000100B	Method Blank	Total	Water	1613B-Tetras	
G2I050000100C	Lab Control Sample	Total	Water	1613B-Tetras	

Prep Batch: 2249100_P

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
G2H310438001	STOCKDALE WEST	Total	Water	EXTRACTION: Soxhlet and Sep Funnel	
G2H310438002	STOCKDALE EAST	Total	Water	EXTRACTION: Soxhlet and Sep Funnel	
G2I050000100B	Method Blank	Total	Water	EXTRACTION: Soxhlet and Sep Funnel	
G2I050000100C	Lab Control Sample	Total	Water	EXTRACTION: Soxhlet and Sep Funnel	

Lab Chronicle

Client: FGL Environmental
Project/Site: SP 1208765-(2-24140)

TestAmerica Job ID: G2H310438

Client Sample ID: STOCKDALE WEST

Lab Sample ID: G2H310438001

Date Collected: 08/29/12 09:30

Matrix: Water

Date Received: 08/31/12 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	EXTRACTION: Soxhlet and Sep Funnel			2249100_P	09/06/12 09:00	TL	TAL WSC
Total	Analysis	1613B-Tetras		0.99	2249100	09/11/12 16:14	SO	TAL WSC

Client Sample ID: STOCKDALE EAST

Lab Sample ID: G2H310438002

Date Collected: 08/29/12 10:30

Matrix: Water

Date Received: 08/31/12 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	EXTRACTION: Soxhlet and Sep Funnel			2249100_P	09/06/12 09:00	TL	TAL WSC
Total	Analysis	1613B-Tetras		1	2249100	09/11/12 16:51	SO	TAL WSC

Laboratory References:

TAL WSC = TestAmerica West Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Certification Summary

Client: FGL Environmental
Project/Site: SP 1208765-(2-24140)

TestAmerica Job ID: G2H310438

Laboratory: TestAmerica West Sacramento

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2928-01	01-31-14
Alaska (UST)	State Program	10	UST-055	12-18-12
Arizona	State Program	9	AZ0708	08-11-13
Arkansas DEQ	State Program	6	88-0691	06-17-13
California	NELAC	9	1119CA	01-31-13
Colorado	State Program	8	N/A	08-31-13
Connecticut	State Program	1	PH-0691	06-30-13
Florida	NELAC	4	E87570	06-30-13
Guam	State Program	9	N/A	08-31-13
Hawaii	State Program	9	N/A	01-31-13
Illinois	NELAC	5	200060	03-17-13
Kansas	NELAC	7	E-10375	10-31-12
Louisiana	NELAC	6	30612	06-30-13
Michigan	State Program	5	9947	01-31-13
Nevada	State Program	9	CA44	07-31-13
New Jersey	NELAC	2	CA005	06-30-13
New York	NELAC	2	11666	04-01-13
Northern Mariana Islands	State Program	9	MP0007	01-31-13
Oregon	NELAC	10	CA200005	03-28-13
Pennsylvania	NELAC	3	68-01272	03-31-13
South Carolina	State Program	4	87014	06-30-13
Texas	NELAC	6	T104704399-08-TX	05-31-13
US Fish & Wildlife	Federal		LE148388-0	02-28-13
USDA	Federal		P330-11-00436	12-30-14
Utah	NELAC	8	QUAN1	01-31-13
Washington	State Program	10	C581	05-05-13
West Virginia	State Program	3	9930C	12-31-12
West Virginia DEP	State Program	3	334	07-31-13
Wisconsin	State Program	5	998204680	08-31-13
Wyoming	State Program	8	8TMS-Q	01-31-13

Method Summary

Client: FGL Environmental
Project/Site: SP 1208765-(2-24140)

TestAmerica Job ID: G2H310438

Method	Method Description	Protocol	Laboratory
1613B-Tetras	Dioxins/Furans, HRGC/HRMS (1613B-Tetras Only)	EPA-5	TAL WSC

Protocol References:

EPA-5 = EPA-5

Laboratory References:

TAL WSC = TestAmerica West Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: FGL Environmental
Project/Site: SP 1208765-(2-24140)

TestAmerica Job ID: G2H310438

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
G2H310438001	STOCKDALE WEST	Water	08/29/12 09:30	08/31/12 09:10
G2H310438002	STOCKDALE EAST	Water	08/29/12 10:30	08/31/12 09:10

G2H310438

Subcontract to
Test America Sacramento

Map Ref.

Client: **Fruit Growers Laboratory, Inc.**

Address: FGL Environmental, Inc.
853 Corporation St.
Santa Paula, CA 93060-3005

Phone: (805)392-2039 Fax: (805)525-6264

Contact Person:

Project Name: **SP 1208765 - (2-24140)**

Purchase Order Number:

Sampler(s) Andrew Hausheer

Compositor Setup Date: ____/____/____ Time: ____/____

Lab Number:

Samp Num	Location Description	Date Sampled	Time Sampled	Method of Sampling: Composite(C) Grab(G)	Type of Sample **SEE REVERSE SIDE**	Potable(P) Non-Potable(NP) Ag Water(AgW)	Bacti Type: Other(O) System(SYS) Source(SR) Waste(W)	Bacti Reason: Routine(ROUT) Repeat(RPT) Replace(RPL) Other(O) Special(SPL)	Dioxin-Dioxin EPA 1613B (2,3,7,8 TCDD Only) 1000ml(AGT)								
1	Stockdale West	08/29/12	09:30	G	GW				1								
2	Stockdale East	08/29/12	10:30	G	GW				1								

Remarks:

Relinquished	Date:	Time:	Relinquished	Date:	Time:	Relinquished	Date:	Time:
	8/30/12	17:30						
Received By:	**Date:**	**Time:**	**Received By:**	**Date:**	**Time:**	**Received By:**	**Date:**	**Time:**
Nicole Kearney	8/31/12	1015						

2.6°

9/17/2012

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

LOT RECEIPT CHECKLIST
TestAmerica West Sacramento

CLIENT FGL PM DA

LOT# (QUANTIMS ID) G2H310438 QUOTE# 30647 LOCATION W13B

Checked (✓)

DATE RECEIVED 8/31/12 TIME RECEIVED 900 ☑

DELIVERED BY ☑ FEDEX ☐ ON TRAC ☐ OTHER

☐ GOLDENSTATE ☐ UPS ☐ EZ PARCEL

☐ TAL COURIER ☐ TAL SF ☐ CLIENT ☑

SHIPPPING CONTAINER(S) ☑ TAL ☐ CLIENT ☐ N/A

MULIT-COOLER(S) (If checked see multi-cooler form) ☐

SINGLE COOLER INFORMATION N/A

CUSTODY SEAL STATUS ☑ INTACT ☐ BROKEN ☐ N/A ☐ ☑

CUSTODY SEAL #(S) NA

COC #(S) NA ☐ ☑

TEMPERATURE BLANK Observed: NA Corrected: NA

SAMPLE TEMPERATURE - (TEMPERATURES ARE IN °C)

Observed: 3.3 Average 3.3 Corrected Average 1.3

LABORATORY THERMOMETER ID:

IR UNIT: #4 ☑ #5 ☐ ☐ OTHER ☐ ☑

JS (Initials) 8/31/12 (Date)

==========

pH MEASURED ☐ YES ☐ ANOMALY ☑ N/A ☑

LABELED BY..... NB ☑

LOGGED IN BY..... JS ☑

SHORT HOLD TEST NOTIFICATION

SAMPLE RECEIVING ☑

WETCHEM ☑ N/A ☑

VOA-ENCORES ☑ N/A ☑

☐ METALS NOTIFIED OF FILTER/PRESERVE VIA VERBAL & EMAIL ☑ N/A ☑

☑ COMPLETE SHIPMENT RECEIVED IN GOOD CONDITION WITH APPROPRIATE TEMPERATURES, CONTAINERS, PRESERVATIVES ☐ N/A ☑

☐ CLOUSEAU ☐ TEMPERATURE EXCEEDED (0 °C – 6 °C)*1 ☑ N/A

☑ WET ICE ☐ BLUE ICE ☐ GEL PACK ☐ NO COOLING AGENTS USED

JS (Initials) 8/31/12 (Date)

Notes

*1 Acceptable temperature range for State of Wisconsin samples is ≤4°C.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Bottle Lot Inventory

Lot ID: G2H310438

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VOA*																				
VOAh*																				
VOAmeoh																				
AGB	1	1																		
AGBs																				
250AGB																				
250AGBs																				
250AGBn																				
500AGB																				
____AGJ																				
500AGJ																				
250AGJ																				
125AGJ																				
125AGJmeoh																				
____CGJ																				
500CGJ																				
250CGJ																				
125CGJ																				
PJ																				
PJn																				
500PJ																				
500PJn																				
500PJna																				
500PJzn/na																				
250PJ																				
250PJn																				
250PJna																				
250PJzn/na																				
Acetate Tube																				
_____"CT																				
Encore																				
Folder/filter																				
PUF																				
Petri/Filter																				
XAD Trap																				
Ziploc																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

h = hydrochloric acid **s** = sulfuric acid **na** = sodium hydroxide **n** = nitric acid **zn** = zinc acetate

Number of VOAs with air bubbles present / total number of VOA's

OnTrac
On Time Delivery For Less

800.334.5000
ontrac.com

D10010505996087

Date Printed 8/30/2012

Tracking#D10010505996087

Shipped From:
FGL ENVIRONMENTAL
853 CORPORATION STREET
SANTA PAULA, CA 93060

Sent By: VICKI ZIGLER
Phone#: (805)392-2037
wgt(lbs): 18
Reference: SP1208765-8/30/12-BQ
Reference 2:

Ship To Company:	*Service:* **S**
TEST AMERICA **880 RIVERSIDE PARKWAY** **WEST SACRAMENTO, CA 95605** **SAMPLE RECEIVING (916)374-4402**	*Sort Code:* **SAC** *Special Services:*

October 8, 2012

Thomas Harder & Co.
801 E. Yorba Linda Blvd.
Suite 3a
Placentia, CA 92870

Lab ID : SP 1208765
Customer : 2-24140

Laboratory Report

Introduction: This report package contains total of 49 pages divided into 4 sections:

Case Narrative	(5 pages)	: An overview of the work performed at FGL.
Sample Results	(15 pages)	: Results for each sample submitted.
Interpretation	(8 pages)	: Drinking Water Interpretation for each sample submitted.
Quality Control	(21 pages)	: Supporting Quality Control (QC) results.

Case Narrative

This Case Narrative pertains to the following samples:

Sample Description	Date Sampled	Date Received	FGL Lab ID #	Matrix
Travel Blank	08/29/2012	08/29/2012	SP 1208765-000	LBW
Stockdale West	08/29/2012	08/29/2012	SP 1208765-001	GW
Stockdale East	08/29/2012	08/29/2012	SP 1208765-002	GW

Sampling and Receipt Information: All samples were received, prepared and analyzed within the method specified holding except those as listed in the table below. The holding time for Fluoride, pH are listed as immediate. Logistically this is very difficult to obtain. FGL policy is to analyze all samples requiring Fluoride, pH on the same day of receipt at the laboratory. If this presents any problem please call.

Lab ID	Analyte/Method	Required Holding Time	Actual Holding Time
SP 1208765-001	pH	15	441 Minutes
SP 1208765-002	pH	15	381 Minutes

All samples arrived on ice. All samples were checked for pH if acid or base preservation is required (except for VOAs). For details of sample receipt information, please see the attached Chain of Custody and Condition Upon Receipt Form.

Corporate Offices & Laboratory
853 Corporation Street
Santa Paula, CA 93060
TEL: (805)392-2000
Env FAX: (805)525-4172 / Ag FAX: (805)392-2063
CA NELAP Certification No. 01110CA

Office & Laboratory
2500 Stagecoach Road
Stockton, CA 95215
TEL: (209)942-0182
FAX: (209)942-0423
CA ELAP Certification No. 1563

Office & Laboratory
563 E. Lindo Avenue
Chico, CA 95926
TEL: (530)343-5818
FAX: (530)343-3807
CA ELAP Certification No. 2670

Office & Laboratory
3442 Empresa Drive, Suite D
San Luis Obispo, CA 93401
TEL: (805)783-2940
FAX: (805)525-4172
CA ELAP Certification No. 2775

Field Office
Visalia, California
TEL: (559)734-9473
Mobile: (559)737-2399
FAX: (559)734-8435

October 8, 2012 Lab ID : SP 1208765
Thomas Harder & Co. Customer : 2-24140

Quality Control: All samples were prepared and analyzed according to the following tables:

Inorganic - Metals QC

200.7	08/30/2012:212887 All analysis quality controls are within established criteria.
	08/30/2012:209644 All preparation quality controls are within established criteria.
200.8	09/01/2012:212888 All analysis quality controls are within established criteria.
	09/07/2012:213175 All analysis quality controls are within established criteria.
	09/01/2012:209690 All preparation quality controls are within established criteria, except: The following note applies to Silver, Arsenic, Barium, Beryllium, Cadmium, Chromium, Nickel, Lead, Antimony, Selenium, Thallium, Vanadium: 435 Sample matrix may be affecting this analyte. Data was accepted based on the LCS or CCV recovery. The following note applies to Silver: 435 Sample matrix may be affecting this analyte. Data was accepted based on the LCS or CCV recovery.
245.1	09/06/2012:213172 All analysis quality controls are within established criteria.
	09/05/2012:209849 All preparation quality controls are within established criteria.

Organic QC

504	09/04/2012:209780 All preparation quality controls are within established criteria.
504.1	09/05/2012:213041 All analysis quality controls are within established criteria.
505	09/13/2012:213456 All analysis quality controls are within established criteria, except: The following note applies to Lindane: 360 CCV above Acceptance Range (AR). Samples which were non detect for this analyte were accepted.
	09/12/2012:210104 All preparation quality controls are within established criteria.
507	09/19/2012:213710 All analysis quality controls are within established criteria.
	09/10/2012:210043 All preparation quality controls are within established criteria, except: The following note applies to Metolachlor, EPN/Triphenylphosphate: 435 Sample matrix may be affecting this analyte. Data was accepted based on the LCS or CCV recovery. The following note applies to Alachlor, Atrazine, Cyanazine, Metribuzin: 435 Sample matrix may be affecting this analyte. Data was accepted based on the LCS or CCV recovery.
515.3	09/12/2012:213356 All analysis quality controls are within established criteria.
	09/12/2012:213680 All analysis quality controls are within established criteria, except:

Organic QC

515.3	The following note applies to 2,4-D, 2,4,5-T, 2,4,5-TP (Silvex), Bentazon, Dalapon, Dicamba, Dinoseb, Pentachlorophenol: 360 CCV above Acceptance Range (AR). Samples which were non detect for this analyte were accepted.
	09/11/2012:210091 All preparation quality controls are within established criteria.
524.2	08/30/2012:212822 All analysis quality controls are within established criteria.
	08/31/2012:212822 All analysis quality controls are within established criteria.
	08/30/2012:209697 All preparation quality controls are within established criteria, except: The following note applies to cis-1,3-Dichloropropene: 435 Sample matrix may be affecting this analyte. Data was accepted based on the LCS or CCV recovery. The following note applies to Chloroethane (Ethyl Chloride), Vinyl Chloride: 435 Sample matrix may be affecting this analyte. Data was accepted based on the LCS or CCV recovery.
531.1	09/12/2012:213421 All analysis quality controls are within established criteria.
	09/13/2012:213421 All analysis quality controls are within established criteria.
	09/12/2012:210149 All preparation quality controls are within established criteria.
547	09/06/2012:213097 All analysis quality controls are within established criteria.
	09/06/2012:209907 All preparation quality controls are within established criteria.
548.1	09/12/2012:213471 All analysis quality controls are within established criteria.
	09/05/2012:209840 All preparation quality controls are within established criteria.
549	09/04/2012:209775 All preparation quality controls are within established criteria, except: The following note applies to Diquat Dibromide: 435 Sample matrix may be affecting this analyte. Data was accepted based on the LCS or CCV recovery.
549.2	09/11/2012:213332 All analysis quality controls are within established criteria.

Radio QC

900.0	09/11/2012:213450 All analysis quality controls are within established criteria.
	09/11/2012:213451 All analysis quality controls are within established criteria.
	09/11/2012:209973 All preparation quality controls are within established criteria.

Radio QC

908.0	09/19/2012:213936 All analysis quality controls are within established criteria.
	09/17/2012:210277 All preparation quality controls are within established criteria.

Inorganic - Wet Chemistry QC

2120B	08/30/2012:212801 All analysis quality controls are within established criteria.
	08/30/2012:209681 All preparation quality controls are within established criteria.
2130B	08/30/2012:212918 All analysis quality controls are within established criteria.
	08/30/2012:209763 All preparation quality controls are within established criteria.
2150B	08/30/2012:209680 All preparation quality controls are within established criteria.
2320B	09/04/2012:212980 All analysis quality controls are within established criteria.
	09/04/2012:209753 All preparation quality controls are within established criteria, except: The following note applies to Alkalinity (as CaCO3): 440 Sample nonhomogeneity may be affecting this analyte. Data was accepted based on the LCS or CCV recovery.
2510B	08/30/2012:212774 All analysis quality controls are within established criteria.
	08/30/2012:209665 All preparation quality controls are within established criteria.
2540CE	08/31/2012:209720 All preparation quality controls are within established criteria.
300.0	08/30/2012:212905 All analysis quality controls are within established criteria.
	08/30/2012:209694 All preparation quality controls are within established criteria.
314.0	09/13/2012:213479 All analysis quality controls are within established criteria.
	09/13/2012:210197 All preparation quality controls are within established criteria.
4500CNCE	08/31/2012:212797 All analysis quality controls are within established criteria.
	08/29/2012:209622 All preparation quality controls are within established criteria.
4500-H B	08/29/2012:209630 All preparation quality controls are within established criteria.
4500HB	08/29/2012:212723 All analysis quality controls are within established criteria.

October 8, 2012 Lab ID : SP 1208765
Thomas Harder & Co. Customer : 2-24140

Inorganic - Wet Chemistry QC

5540C	08/30/2012:212788 All analysis quality controls are within established criteria.
	08/30/2012:209674 All preparation quality controls are within established criteria.

Certification:: I certify that this data package is in compliance with NELAC standards, both technically and for completeness, except for any conditions listed above. Release of the data contained in this data package is authorized by the Laboratory Director or his designee, as verified by the following electronic signature.

KD:DMB

Approved By **Kelly A. Dunnahoo, B.S.** Digitally signed by Kelly A. Dunnahoo, B.S.
Title: Laboratory Director
Date: 2012-10-08

October 8, 2012

Thomas Harder & Co.
801 E. Yorba Linda Blvd.
Suite 3a
Placentia, CA 92870

Description : Travel Blank
Project : Stockdale East/West H20 Sampling

Lab ID : SP 1208765-000
Customer ID : 2-24140

Sampled On : August 29, 2012-00:00
Sampled By : Andrew Hausheer
Received On : August 29, 2012-13:04
Matrix : Lab. Blank Water

Sample Result - Organic

Constituent	Result	PQL	Units	Note	Sample Preparation Method	Sample Preparation Date/ID	Sample Analysis Method	Sample Analysis Date/ID
EPA 504.1[VOA:1]								
1,3-Dibromopropane‡	96.6	70-130	%		504	09/04/12:209780	504.1	09/05/12:213041
DBCP	ND	0.01	ug/L		504	09/04/12:209780	504.1	09/05/12:213041
EDB	ND	0.02	ug/L		504	09/04/12:209780	504.1	09/05/12:213041

ND=Non-Detected. PQL=Practical Quantitation Limit. Containers: (AGT) Amber Glass TFE-Cap, (AST) Amber Silanized-TFE, (P) Plastic, (VOA) VOA
Preservatives: Monochloracetic Buffer, H2SO4 pH < 2, NaOH, HNO3 pH < 2, HNO3 pH < 2, HCl pH < 2 ‡Surrogate. * PQL adjusted for dilution.

Corporate Offices & Laboratory
853 Corporation Street
Santa Paula, CA 93060
TEL: (805)392-2000
Env FAX: (805)525-4172 / Ag FAX: (805)392-2063
CA NELAP Certification No. 01110CA

Office & Laboratory
2500 Stagecoach Road
Stockton, CA 95215
TEL: (209)942-0182
FAX: (209)942-0423
CA ELAP Certification No. 1563

Office & Laboratory
563 E. Lindo Avenue
Chico, CA 95926
TEL: (530)343-5818
FAX: (530)343-3807
CA ELAP Certification No. 2670

Office & Laboratory
3442 Empresa Drive, Suite D
San Luis Obispo, CA 93401
TEL: (805)783-2940
FAX: (805)525-4172
CA ELAP Certification No. 2775

Field Office
Visalia, California
TEL: (559)734-9473
Mobile: (559)737-2399
FAX: (559)734-8435

October 8, 2012

Lab ID : SP 1208765-001
Customer ID : 2-24140

Thomas Harder & Co.
801 E. Yorba Linda Blvd.
Suite 3a
Placentia, CA 92870

Sampled On : August 29, 2012-09:30
Sampled By : Andrew Hausheer
Received On : August 29, 2012-13:04
Matrix : Ground Water

Description : Stockdale West
Project : Stockdale East/West H20 Sampling

Sample Result - Inorganic

Constituent	Result	PQL	Units	Note	Sample Preparation Method	Sample Preparation Date/ID	Sample Analysis Method	Sample Analysis Date/ID
General Mineral[P:1'4]								
Total Hardness as CaCO3	182	2.5	mg/L		200.7	08/30/12:209644	200.7	08/30/12:212887
Calcium	68	1	mg/L		200.7	08/30/12:209644	200.7	08/30/12:212887
Magnesium	3	1	mg/L		200.7	08/30/12:209644	200.7	08/30/12:212887
Potassium	1	1	mg/L		200.7	08/30/12:209644	200.7	08/30/12:212887
Sodium	42	1	mg/L		200.7	08/30/12:209644	200.7	08/30/12:212887
Total Cations	5.5	0.1	meq/L		200.7	08/30/12:209644	200.7	08/30/12:212887
Boron	0.2	0.1	mg/L		200.7	08/30/12:209644	200.7	08/30/12:212887
Copper	ND	10	ug/L		200.7	08/30/12:209644	200.7	08/30/12:212887
Iron	ND	50	ug/L		200.7	08/30/12:209644	200.7	08/30/12:212887
Manganese	ND	10	ug/L		200.7	08/30/12:209644	200.7	08/30/12:212887
Zinc	ND	20	ug/L		200.7	08/30/12:209644	200.7	08/30/12:212887
SAR	1.4	0.1	--		200.7	08/30/12:209644	200.7	08/30/12:212887
Total Alkalinity (as CaCO3)	110	10	mg/L		2320B	09/04/12:209753	2320B	09/04/12:212980
Hydroxide	ND	10	mg/L		2320B	09/04/12:209753	2320B	09/04/12:212980
Carbonate	ND	10	mg/L		2320B	09/04/12:209753	2320B	09/04/12:212980
Bicarbonate	130	10	mg/L		2320B	09/04/12:209753	2320B	09/04/12:212980
Sulfate	36	2	mg/L		300.0	08/30/12:209694	300.0	08/30/12:212905
Chloride	81	1	mg/L		300.0	08/30/12:209694	300.0	08/30/12:212905
Nitrate	13.4	0.4	mg/L		300.0	08/30/12:209694	300.0	08/30/12:212905
Nitrite as N	ND	0.1	mg/L		300.0	08/30/12:209694	300.0	08/30/12:212905
Nitrate + Nitrite as N	3.0	0.1	mg/L		300.0	08/30/12:209694	300.0	08/30/12:212905
Fluoride	ND	0.1	mg/L		300.0	08/30/12:209694	300.0	08/30/12:212905
Total Anions	5.4	0.1	meq/L		2320B	09/04/12:209753	2320B	09/04/12:212980
pH	7.6	--	units		4500-H B	08/29/12:209630	4500HB	08/29/12:212723
Specific Conductance	590	1	umhos/cm		2510B	08/30/12:209665	2510B	08/30/12:212774
Total Dissolved Solids	400	20	mg/L		2540CE	08/31/12:209720	2540C	09/04/12:212936
MBAS Screen	ND	0.1	mg/L		5540C	08/30/12:209674	5540C	08/30/12:212788
Aggressiveness Index	11.9	1	--		4500-H B	08/29/12:209630	4500HB	08/29/12:212723
Langlier Index (20°C)	0.02	1	--		4500-H B	08/29/12:209630	4500HB	08/29/12:212723
Metals, Total[P:1]								
Aluminum	20	10	ug/L		200.8	09/01/12:209690	200.8	09/01/12:212888
Antimony	ND	1	ug/L		200.8	09/01/12:209690	200.8	09/07/12:213175
Arsenic	ND	2	ug/L		200.8	09/01/12:209690	200.8	09/01/12:212888
Barium	43.1	0.2	ug/L		200.8	09/01/12:209690	200.8	09/07/12:213175
Beryllium	ND	1	ug/L		200.8	09/01/12:209690	200.8	09/01/12:212888

Corporate Offices & Laboratory
853 Corporation Street
Santa Paula, CA 93060
TEL: (805)392-2000
Env FAX: (805)525-4172 / Ag FAX: (805)392-2063
CA NELAP Certification No. 01110CA

Office & Laboratory
2500 Stagecoach Road
Stockton, CA 95215
TEL: (209)942-0182
FAX: (209)942-0423
CA ELAP Certification No. 1563

Office & Laboratory
563 E. Lindo Avenue
Chico, CA 95926
TEL: (530)343-5818
FAX: (530)343-3807
CA ELAP Certification No. 2670

Office & Laboratory
3442 Empresa Drive, Suite D
San Luis Obispo, CA 93401
TEL: (805)783-2940
FAX: (805)525-4172
CA ELAP Certification No. 2775

Field Office
Visalia, California
TEL: (559)734-9473
Mobile: (559)737-2399
FAX: (559)734-8435

October 8, 2012 Lab ID : SP 1208765-001
Description : Stockdale West Customer ID : 2-24140

Sample Result - Inorganic

Constituent	Result	PQL	Units	Note	Sample Preparation		Sample Analysis	
					Method	Date/ID	Method	Date/ID
Metals, Total[P:1]								
Cadmium	ND	0.2	ug/L		200.8	09/01/12:209690	200.8	09/01/12:212888
Chromium	ND	1	ug/L		200.8	09/01/12:209690	200.8	09/01/12:212888
Lead	0.3	0.2	ug/L		200.8	09/01/12:209690	200.8	09/01/12:212888
Mercury	ND	0.02	ug/L		245.1	09/05/12:209849	245.1	09/06/12:213172
Nickel	ND	1	ug/L		200.8	09/01/12:209690	200.8	09/01/12:212888
Selenium	ND	2	ug/L		200.8	09/01/12:209690	200.8	09/01/12:212888
Silica	26	2	mg/L		200.7	08/30/12:209644	200.7	08/30/12:212887
Silver	ND	1	ug/L		200.8	09/01/12:209690	200.8	09/01/12:212888
Thallium	ND	0.2	ug/L		200.8	09/01/12:209690	200.8	09/01/12:212888
Vanadium	4	2	ug/L		200.8	09/01/12:209690	200.8	09/01/12:212888
Wet Chemistry[P:1'10]								
Color	ND	5	units		2120B	08/30/12:209681	2120B	08/30/12:212801
Cyanide, Total	ND	0.004	mg/L		4500CNCE	08/29/12:209622	4500CNCE	08/31/12:212797
Odor	ND	1	TON		2150B	08/30/12:209680	2150B	08/30/12:212800
Turbidity	1.6	0.2	NTU		2130B	08/30/12:209763	2130B	08/30/12:212918
Perchlorate	ND	2	ug/L		314.0	09/13/12:210197	314.0	09/13/12:213479

ND=Non-Detected. PQL=Practical Quantitation Limit. Containers: (AGT) Amber Glass TFE-Cap, (AST) Amber Silanized-TFE, (P) Plastic, (VOA) VOA
Preservatives: Monochloracetic Buffer, H2SO4 pH < 2, NaOH, HNO3 pH < 2, HNO3 pH < 2, HCl pH < 2 ‡Surrogate. * PQL adjusted for dilution.

October 8, 2012

Lab ID : SP 1208765-001
Customer ID : 2-24140

Thomas Harder & Co.
801 E. Yorba Linda Blvd.
Suite 3a
Placentia, CA 92870

Sampled On : August 29, 2012-09:30
Sampled By : Andrew Hausheer
Received On : August 29, 2012-13:04
Matrix : Ground Water

Description : Stockdale West
Project : Stockdale East/West H20 Sampling

Sample Result - Organic

Constituent	Result	PQL	Units	Note	Sample Preparation Method	Sample Preparation Date/ID	Sample Analysis Method	Sample Analysis Date/ID
EPA 504.1[VOA:1]								
1,3-Dibromopropane‡	98.8	70-130	%		504	09/04/12:209780	504.1	09/05/12:213041
DBCP	ND	0.01	ug/L		504	09/04/12:209780	504.1	09/05/12:213041
EDB	0.02	0.02	ug/L		504	09/04/12:209780	504.1	09/05/12:213041
EPA 505[VOA:1]								
Alachlor	ND	0.2	ug/L		505	09/12/12:210104	505	09/13/12:213456
Aldrin	ND	0.01	ug/L		505	09/12/12:210104	505	09/13/12:213456
Chlordane	ND	0.1	ug/L		505	09/12/12:210104	505	09/13/12:213456
Dieldrin	ND	0.01	ug/L		505	09/12/12:210104	505	09/13/12:213456
Endrin	ND	0.01	ug/L		505	09/12/12:210104	505	09/13/12:213456
Heptachlor	ND	0.01	ug/L		505	09/12/12:210104	505	09/13/12:213456
Heptachlor Epoxide	ND	0.01	ug/L		505	09/12/12:210104	505	09/13/12:213456
Hexachlorobenzene	ND	0.01	ug/L		505	09/12/12:210104	505	09/13/12:213456
Hexachlorocyclopentadiene	ND	0.1	ug/L		505	09/12/12:210104	505	09/13/12:213456
Lindane (Gamma NHC)	ND	0.05	ug/L		505	09/12/12:210104	505	09/13/12:213456
Methoxychlor	ND	0.1	ug/L		505	09/12/12:210104	505	09/13/12:213456
Toxaphene	ND	0.5	ug/L		505	09/12/12:210104	505	09/13/12:213456
PCB 1016	ND	0.5	ug/L		505	09/12/12:210104	505	09/13/12:213456
PCB 1221	ND	0.5	ug/L		505	09/12/12:210104	505	09/13/12:213456
PCB 1232	ND	0.5	ug/L		505	09/12/12:210104	505	09/13/12:213456
PCB 1242	ND	0.5	ug/L		505	09/12/12:210104	505	09/13/12:213456
PCB 1248	ND	0.5	ug/L		505	09/12/12:210104	505	09/13/12:213456
PCB 1254	ND	0.5	ug/L		505	09/12/12:210104	505	09/13/12:213456
PCB 1260	ND	0.5	ug/L		505	09/12/12:210104	505	09/13/12:213456
EPA 507[AGT:1]								
Triphenylphosphate‡	70.8	70-130	%		507	09/10/12:210043	507	09/19/12:213710
Alachlor	ND	1	ug/L		507	09/10/12:210043	507	09/19/12:213710
Atrazine	ND	0.5	ug/L		507	09/10/12:210043	507	09/19/12:213710
Bromacil	ND	2	ug/L		507	09/10/12:210043	507	09/19/12:213710
Butachlor	ND	1	ug/L		507	09/10/12:210043	507	09/19/12:213710
Diazinon	ND	2	ug/L		507	09/10/12:210043	507	09/19/12:213710
Dimethoate	ND	2	ug/L		507	09/10/12:210043	507	09/19/12:213710
Metolachlor	ND	1	ug/L		507	09/10/12:210043	507	09/19/12:213710
Metribuzin	ND	0.5	ug/L		507	09/10/12:210043	507	09/19/12:213710
Molinate	ND	2	ug/L		507	09/10/12:210043	507	09/19/12:213710
Prometryne	ND	2	ug/L		507	09/10/12:210043	507	09/19/12:213710

Corporate Offices & Laboratory
853 Corporation Street
Santa Paula, CA 93060
TEL: (805)392-2000
Env FAX: (805)525-4172 / Ag FAX: (805)392-2063
CA NELAP Certification No. 01110CA

Office & Laboratory
2500 Stagecoach Road
Stockton, CA 95215
TEL: (209)942-0182
FAX: (209)942-0423
CA ELAP Certification No. 1563

Office & Laboratory
563 E. Lindo Avenue
Chico, CA 95926
TEL: (530)343-5818
FAX: (530)343-3807
CA ELAP Certification No. 2670

Office & Laboratory
3442 Empresa Drive, Suite D
San Luis Obispo, CA 93401
TEL: (805)783-2940
FAX: (805)525-4172
CA ELAP Certification No. 2775

Field Office
Visalia, California
TEL: (559)734-9473
Mobile: (559)737-2399
FAX: (559)734-8435

October 8, 2012 Lab ID : SP 1208765-001
Description : Stockdale West Customer ID : 2-24140

Sample Result - Organic

Constituent	Result	PQL	Units	Note	Sample Preparation		Sample Analysis	
					Method	Date/ID	Method	Date/ID
EPA 507[AGT:1]								
Propachlor	ND	1	ug/L		507	09/10/12:210043	507	09/19/12:213710
Simazine	ND	1	ug/L		507	09/10/12:210043	507	09/19/12:213710
Thiobencarb	ND	1	ug/L		507	09/10/12:210043	507	09/19/12:213710
Cyanazine	ND	0.5	ug/L		507	09/10/12:210043	507	09/19/12:213710
EPA 515[AGT:1]								
2,4-DCAA‡	103	70-130	%		515.3	09/11/12:210091	515.3	09/12/12:213356
Bentazon	ND	2	ug/L		515.3	09/11/12:210091	515.3	09/12/12:213680
2,4-D	ND	2	ug/L		515.3	09/11/12:210091	515.3	09/12/12:213680
Dalapon	ND	10	ug/L		515.3	09/11/12:210091	515.3	09/12/12:213680
Dicamba	ND	1	ug/L		515.3	09/11/12:210091	515.3	09/12/12:213680
Dinoseb	ND	1	ug/L		515.3	09/11/12:210091	515.3	09/12/12:213680
Pentachlorophenol	ND	0.2	ug/L		515.3	09/11/12:210091	515.3	09/12/12:213680
Picloram	ND	1	ug/L		515.3	09/11/12:210091	515.3	09/12/12:213680
2,4,5-TP (Silvex)	ND	1	ug/L		515.3	09/11/12:210091	515.3	09/12/12:213680
2,4,5-T	ND	1	ug/L		515.3	09/11/12:210091	515.3	09/12/12:213680
EPA 524.2[VOA:1'3]								
4-Bromofluorobenzene‡	96.4	70-130	%		524.2	08/30/12:209697	524.2	08/30/12:212822
1,2-Dichlorobenzene-d4‡	85.9	70-130	%		524.2	08/30/12:209697	524.2	08/30/12:212822
Benzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Bromobenzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Bromochloromethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Bromodichloromethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Bromoform	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Bromomethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
n-Butylbenzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
sec-Butylbenzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
tert-Butylbenzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Carbon Tetrachloride	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Chlorobenzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Chloroethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Chloroform	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Chloromethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
2-Chlorotoluene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
4-Chlorotoluene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Dibromochloromethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Dibromomethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
1,2-Dichlorobenzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
1,3-Dichlorobenzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822

October 8, 2012 Lab ID : SP 1208765-001
Description : Stockdale West Customer ID : 2-24140

Sample Result - Organic

Constituent	Result	PQL	Units	Note	Sample Preparation		Sample Analysis	
					Method	Date/ID	Method	Date/ID
EPA 524.2[VOA:1'3]								
1,4-Dichlorobenzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Dichlorodifluoromethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
1,1-Dichloroethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
1,2-Dichloroethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
1,1-Dichloroethylene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
cis-1,2-Dichloroethylene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
trans-1,2-Dichloroethylene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
1,2-Dichloropropane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
1,3-Dichloropropane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Dichloromethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
2,2-Dichloropropane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
1,1-Dichloropropene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
1,3-Dichloropropene (Total)	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
cis-1,3-Dichloropropene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
trans-1,3-Dichloropropene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Di-isopropyl ether (DIPE)	ND	3	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Ethyl Benzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Ethyl tert-Butyl Ether (ETBE)	ND	3	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Hexachlorobutadiene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Isopropylbenzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
p-Isopropyltoluene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Methyl tert-Butyl Ether (MTBE)	ND	1	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Naphthalene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
n-Propylbenzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Styrene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Tert-amyl-methyl Ether (TAME)	ND	3	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Tetrachloroethylene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Toluene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
1,2,3-Trichlorobenzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
1,2,4-Trichlorobenzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
1,1,1-Trichloroethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
1,1,2-Trichloroethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Trichloroethylene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Trichlorofluoromethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
1,1,2-Trichlorotrifluoroethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
1,2,4-Trimethylbenzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822

October 8, 2012 Lab ID : SP 1208765-001
Description : Stockdale West Customer ID : 2-24140

Sample Result - Organic

Constituent	Result	PQL	Units	Note	Sample Preparation		Sample Analysis	
					Method	Date/ID	Method	Date/ID
EPA 524.2[VOA:1'3]								
1,3,5-Trimethylbenzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Vinyl Chloride	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Xylenes (Total)	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Xylenes m,p	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Xylenes o	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
Total Trihalomethanes	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/30/12:212822
EPA 531.1[AGT:1'8]								
Aldicarb	ND	3	ug/L		531.1	09/12/12:210149	531.1	09/12/12:213421
Aldicarb Sulfone	ND	2	ug/L		531.1	09/12/12:210149	531.1	09/12/12:213421
Aldicarb Sulfoxide	ND	3	ug/L		531.1	09/12/12:210149	531.1	09/12/12:213421
Carbaryl	ND	5	ug/L		531.1	09/12/12:210149	531.1	09/12/12:213421
Carbofuran	ND	5	ug/L		531.1	09/12/12:210149	531.1	09/12/12:213421
3-Hydroxycarbofuran	ND	3	ug/L		531.1	09/12/12:210149	531.1	09/12/12:213421
Methomyl	ND	2	ug/L		531.1	09/12/12:210149	531.1	09/12/12:213421
Oxamyl	ND	5	ug/L		531.1	09/12/12:210149	531.1	09/12/12:213421
EPA 547[AGT:1]								
Glyphosate	ND	20	ug/L		547	09/06/12:209907	547	09/06/12:213097
EPA 548.1[AGT:1]								
Endothall	ND	40	ug/L		548.1	09/05/12:209840	548.1	09/12/12:213471
EPA 549[AST:1]								
Diquat	ND	2	ug/L		549	09/04/12:209775	549.2	09/11/12:213332

ND=Non-Detected. PQL=Practical Quantitation Limit. Containers: (AGT) Amber Glass TFE-Cap, (AST) Amber Silanized-TFE, (P) Plastic, (VOA) VOA
Preservatives: Monochloracetic Buffer, H2SO4 pH < 2, NaOH, HNO3 pH < 2, HNO3 pH < 2, HCl pH < 2 ‡Surrogate. * PQL adjusted for dilution.

October 8, 2012

Lab ID : SP 1208765-001
Customer ID : 2-24140

Thomas Harder & Co.
801 E. Yorba Linda Blvd.
Suite 3a
Placentia, CA 92870

Sampled On : August 29, 2012-09:30
Sampled By : Andrew Hausheer
Received On : August 29, 2012-13:04
Matrix : Ground Water

Description : Stockdale West
Project : Stockdale East/West H20 Sampling

Sample Result - Radio

Constituent	Result ± Error	MDA	Units	MCL/AL	Sample Preparation Method	Sample Preparation Date/ID	Sample Analysis Method	Sample Analysis Date/ID
Radio Chemistry[P:1]								
Gross Alpha	18.9 ± 3.01	1.18	pCi/L	15/5	900.0	09/11/12-09:00 2P1209973	900.0	09/11/12-14:30 2A1213450
Uranium	10.2 ± 1.89	0.439	pCi/L	20	908.0	09/17/12-08:10 2P1210277	908.0	09/19/12-15:20 2A1213936

ND=Non-Detected. PQL=Practical Quantitation Limit. Containers: (AGT) Amber Glass TFE-Cap, (AST) Amber Silanized-TFE, (P) Plastic, (VOA) VOA
Preservatives: Monochloracetic Buffer, H2SO4 pH < 2, NaOH, HNO3 pH < 2, HNO3 pH < 2, HCl pH < 2 * PQL adjusted for dilution.

MDA = Minimum Detectable Activity (Calculated at the 95% confidence level) = Data utilized by DHS to determine matrix interference.
MCL / AL = Maximum Contamination Level / Action Level. Alpha's Action Level of 5 pCi/L is based on the Assigned Value (AV).
AV = Assigned Value(Gross Alpha Result + (0.84 x Error)). CCR Section 64442: Drinking Water Compliance Note: Do the following
If Gross Alpha's (AV) exceeds 5 pCi/L run Uranium. If Gross Alpha's (AV) minus Uranium exceeds 5 pCi/L run Radium 226.

Drinking Water Compliance:
Gross Alpha (AV) minus Uranium is less than or equal to 15 pCi/L
Uranium is less than or equal to 20 pCi/L
Radium 226 + Radium 228 is less than or equal to 5 pCi/L

Note: Samples are held for 3-6 months prior to disposal.

Corporate Offices & Laboratory
853 Corporation Street
Santa Paula, CA 93060
TEL: (805)392-2000
Env FAX: (805)525-4172 / Ag FAX: (805)392-2063
CA NELAP Certification No. 01110CA

Office & Laboratory
2500 Stagecoach Road
Stockton, CA 95215
TEL: (209)942-0182
FAX: (209)942-0423
CA ELAP Certification No. 1563

Office & Laboratory
563 E. Lindo Avenue
Chico, CA 95926
TEL: (530)343-5818
FAX: (530)343-3807
CA ELAP Certification No. 2670

Office & Laboratory
3442 Empresa Drive, Suite D
San Luis Obispo, CA 93401
TEL: (805)783-2940
FAX: (805)525-4172
CA ELAP Certification No. 2775

Field Office
Visalia, California
TEL: (559)734-9473
Mobile: (559)737-2399
FAX: (559)734-8435

October 8, 2012

Lab ID : SP 1208765-002
Customer ID : 2-24140

Thomas Harder & Co.
801 E. Yorba Linda Blvd.
Suite 3a
Placentia, CA 92870

Sampled On : August 29, 2012-10:30
Sampled By : Andrew Hausheer
Received On : August 29, 2012-13:04
Matrix : Ground Water

Description : Stockdale East
Project : Stockdale East/West H20 Sampling

Sample Result - Inorganic

Constituent	Result	PQL	Units	Note	Sample Preparation Method	Sample Preparation Date/ID	Sample Analysis Method	Sample Analysis Date/ID
General Mineral[P:1'4]								
Total Hardness as CaCO3	142	2.5	mg/L		200.7	08/30/12:209644	200.7	08/30/12:212887
Calcium	52	1	mg/L		200.7	08/30/12:209644	200.7	08/30/12:212887
Magnesium	3	1	mg/L		200.7	08/30/12:209644	200.7	08/30/12:212887
Potassium	ND	1	mg/L		200.7	08/30/12:209644	200.7	08/30/12:212887
Sodium	33	1	mg/L		200.7	08/30/12:209644	200.7	08/30/12:212887
Total Cations	4.3	0.1	meq/L		200.7	08/30/12:209644	200.7	08/30/12:212887
Boron	0.2	0.1	mg/L		200.7	08/30/12:209644	200.7	08/30/12:212887
Copper	ND	10	ug/L		200.7	08/30/12:209644	200.7	08/30/12:212887
Iron	ND	50	ug/L		200.7	08/30/12:209644	200.7	08/30/12:212887
Manganese	ND	10	ug/L		200.7	08/30/12:209644	200.7	08/30/12:212887
Zinc	30	20	ug/L		200.7	08/30/12:209644	200.7	08/30/12:212887
SAR	1.2	0.1	--		200.7	08/30/12:209644	200.7	08/30/12:212887
Total Alkalinity (as CaCO3)	100	10	mg/L		2320B	09/04/12:209753	2320B	09/04/12:212980
Hydroxide	ND	10	mg/L		2320B	09/04/12:209753	2320B	09/04/12:212980
Carbonate	ND	10	mg/L		2320B	09/04/12:209753	2320B	09/04/12:212980
Bicarbonate	120	10	mg/L		2320B	09/04/12:209753	2320B	09/04/12:212980
Sulfate	34	2	mg/L		300.0	08/30/12:209694	300.0	08/30/12:212905
Chloride	51	1	mg/L		300.0	08/30/12:209694	300.0	08/30/12:212905
Nitrate	14.4	0.4	mg/L		300.0	08/30/12:209694	300.0	08/30/12:212905
Nitrite as N	ND	0.1	mg/L		300.0	08/30/12:209694	300.0	08/30/12:212905
Nitrate + Nitrite as N	3.2	0.1	mg/L		300.0	08/30/12:209694	300.0	08/30/12:212905
Fluoride	ND	0.1	mg/L		300.0	08/30/12:209694	300.0	08/30/12:212905
Total Anions	4.3	0.1	meq/L		2320B	09/04/12:209753	2320B	09/04/12:212980
pH	7.8	--	units		4500-H B	08/29/12:209630	4500HB	08/29/12:212723
Specific Conductance	469	1	umhos/cm		2510B	08/30/12:209665	2510B	08/30/12:212774
Total Dissolved Solids	280	20	mg/L		2540CE	08/31/12:209720	2540C	09/04/12:212936
MBAS Screen	ND	0.1	mg/L		5540C	08/30/12:209674	5540C	08/30/12:212788
Aggressiveness Index	11.9	1	--		4500-H B	08/29/12:209630	4500HB	08/29/12:212723
Langlier Index (20°C)	0.08	1	--		4500-H B	08/29/12:209630	4500HB	08/29/12:212723
Metals, Total[P:1]								
Aluminum	ND	10	ug/L		200.8	09/01/12:209690	200.8	09/01/12:212888
Antimony	ND	1	ug/L		200.8	09/01/12:209690	200.8	09/07/12:213175
Arsenic	ND	2	ug/L		200.8	09/01/12:209690	200.8	09/01/12:212888
Barium	70.2	0.2	ug/L		200.8	09/01/12:209690	200.8	09/07/12:213175
Beryllium	ND	1	ug/L		200.8	09/01/12:209690	200.8	09/01/12:212888

Corporate Offices & Laboratory
853 Corporation Street
Santa Paula, CA 93060
TEL: (805)392-2000
Env FAX: (805)525-4172 / Ag FAX: (805)392-2063
CA NELAP Certification No. 01110CA

Office & Laboratory
2500 Stagecoach Road
Stockton, CA 95215
TEL: (209)942-0182
FAX: (209)942-0423
CA ELAP Certification No. 1563

Office & Laboratory
563 E. Lindo Avenue
Chico, CA 95926
TEL: (530)343-5818
FAX: (530)343-3807
CA ELAP Certification No. 2670

Office & Laboratory
3442 Empresa Drive, Suite D
San Luis Obispo, CA 93401
TEL: (805)783-2940
FAX: (805)525-4172
CA ELAP Certification No. 2775

Field Office
Visalia, California
TEL: (559)734-9473
Mobile: (559)737-2399
FAX: (559)734-8435

October 8, 2012
Description : Stockdale East

Lab ID : SP 1208765-002
Customer ID : 2-24140

Sample Result - Inorganic

Constituent	Result	PQL	Units	Note	Sample Preparation		Sample Analysis	
					Method	Date/ID	Method	Date/ID
Metals, Total[P:1]								
Cadmium	ND	0.2	ug/L		200.8	09/01/12:209690	200.8	09/01/12:212888
Chromium	ND	1	ug/L		200.8	09/01/12:209690	200.8	09/01/12:212888
Lead	ND	0.2	ug/L		200.8	09/01/12:209690	200.8	09/01/12:212888
Mercury	ND	0.02	ug/L		245.1	09/05/12:209849	245.1	09/06/12:213172
Nickel	ND	1	ug/L		200.8	09/01/12:209690	200.8	09/01/12:212888
Selenium	ND	2	ug/L		200.8	09/01/12:209690	200.8	09/01/12:212888
Silica	25	2	mg/L		200.7	08/30/12:209644	200.7	08/30/12:212887
Silver	ND	1	ug/L		200.8	09/01/12:209690	200.8	09/01/12:212888
Thallium	ND	0.2	ug/L		200.8	09/01/12:209690	200.8	09/01/12:212888
Vanadium	5	2	ug/L		200.8	09/01/12:209690	200.8	09/01/12:212888
Wet Chemistry[P:1'10]								
Color	ND	5	units		2120B	08/30/12:209681	2120B	08/30/12:212801
Cyanide, Total	ND	0.004	mg/L		4500CNCE	08/29/12:209622	4500CNCE	08/31/12:212797
Odor	ND	1	TON		2150B	08/30/12:209680	2150B	08/30/12:212800
Turbidity	ND	0.2	NTU		2130B	08/30/12:209763	2130B	08/30/12:212918
Perchlorate	ND	2	ug/L		314.0	09/13/12:210197	314.0	09/13/12:213479

ND=Non-Detected. PQL=Practical Quantitation Limit. Containers: (AGT) Amber Glass TFE-Cap, (AST) Amber Silanized-TFE, (P) Plastic, (VOA) VOA
Preservatives: Monochloracetic Buffer, H2SO4 pH < 2, NaOH, HNO3 pH < 2, HNO3 pH < 2, HCl pH < 2 ‡Surrogate. * PQL adjusted for dilution.

October 8, 2012

Lab ID : SP 1208765-002
Customer ID : 2-24140

Thomas Harder & Co.
801 E. Yorba Linda Blvd.
Suite 3a
Placentia, CA 92870

Sampled On : August 29, 2012-10:30
Sampled By : Andrew Hausheer
Received On : August 29, 2012-13:04
Matrix : Ground Water

Description : Stockdale East
Project : Stockdale East/West H20 Sampling

Sample Result - Organic

Constituent	Result	PQL	Units	Note	Sample Preparation Method	Sample Preparation Date/ID	Sample Analysis Method	Sample Analysis Date/ID
EPA 504.1[VOA:1]								
1,3-Dibromopropane‡	115	70-130	%		504	09/04/12:209780	504.1	09/05/12:213041
DBCP	ND	0.01	ug/L		504	09/04/12:209780	504.1	09/05/12:213041
EDB	ND	0.02	ug/L		504	09/04/12:209780	504.1	09/05/12:213041
EPA 505[VOA:1]								
Alachlor	ND	0.2	ug/L		505	09/12/12:210104	505	09/13/12:213456
Aldrin	ND	0.01	ug/L		505	09/12/12:210104	505	09/13/12:213456
Chlordane	ND	0.1	ug/L		505	09/12/12:210104	505	09/13/12:213456
Dieldrin	ND	0.01	ug/L		505	09/12/12:210104	505	09/13/12:213456
Endrin	ND	0.01	ug/L		505	09/12/12:210104	505	09/13/12:213456
Heptachlor	ND	0.01	ug/L		505	09/12/12:210104	505	09/13/12:213456
Heptachlor Epoxide	ND	0.01	ug/L		505	09/12/12:210104	505	09/13/12:213456
Hexachlorobenzene	ND	0.01	ug/L		505	09/12/12:210104	505	09/13/12:213456
Hexachlorocyclopentadiene	ND	0.1	ug/L		505	09/12/12:210104	505	09/13/12:213456
Lindane (Gamma NHC)	ND	0.05	ug/L		505	09/12/12:210104	505	09/13/12:213456
Methoxychlor	ND	0.1	ug/L		505	09/12/12:210104	505	09/13/12:213456
Toxaphene	ND	0.5	ug/L		505	09/12/12:210104	505	09/13/12:213456
PCB 1016	ND	0.5	ug/L		505	09/12/12:210104	505	09/13/12:213456
PCB 1221	ND	0.5	ug/L		505	09/12/12:210104	505	09/13/12:213456
PCB 1232	ND	0.5	ug/L		505	09/12/12:210104	505	09/13/12:213456
PCB 1242	ND	0.5	ug/L		505	09/12/12:210104	505	09/13/12:213456
PCB 1248	ND	0.5	ug/L		505	09/12/12:210104	505	09/13/12:213456
PCB 1254	ND	0.5	ug/L		505	09/12/12:210104	505	09/13/12:213456
PCB 1260	ND	0.5	ug/L		505	09/12/12:210104	505	09/13/12:213456
EPA 507[AGT:1]								
Triphenylphosphate‡	88.2	70-130	%		507	09/10/12:210043	507	09/19/12:213710
Alachlor	ND	1	ug/L		507	09/10/12:210043	507	09/19/12:213710
Atrazine	ND	0.5	ug/L		507	09/10/12:210043	507	09/19/12:213710
Bromacil	ND	2	ug/L		507	09/10/12:210043	507	09/19/12:213710
Butachlor	ND	1	ug/L		507	09/10/12:210043	507	09/19/12:213710
Diazinon	ND	2	ug/L		507	09/10/12:210043	507	09/19/12:213710
Dimethoate	ND	2	ug/L		507	09/10/12:210043	507	09/19/12:213710
Metolachlor	ND	1	ug/L		507	09/10/12:210043	507	09/19/12:213710
Metribuzin	ND	0.5	ug/L		507	09/10/12:210043	507	09/19/12:213710
Molinate	ND	2	ug/L		507	09/10/12:210043	507	09/19/12:213710
Prometryne	ND	2	ug/L		507	09/10/12:210043	507	09/19/12:213710

Corporate Offices & Laboratory
853 Corporation Street
Santa Paula, CA 93060
TEL: (805)392-2000
Env FAX: (805)525-4172 / Ag FAX: (805)392-2063
CA NELAP Certification No. 01110CA

Office & Laboratory
2500 Stagecoach Road
Stockton, CA 95215
TEL: (209)942-0182
FAX: (209)942-0423
CA ELAP Certification No. 1563

Office & Laboratory
563 E. Lindo Avenue
Chico, CA 95926
TEL: (530)343-5818
FAX: (530)343-3807
CA ELAP Certification No. 2670

Office & Laboratory
3442 Empresa Drive, Suite D
San Luis Obispo, CA 93401
TEL: (805)783-2940
FAX: (805)525-4172
CA ELAP Certification No. 2775

Field Office
Visalia, California
TEL: (559)734-9473
Mobile: (559)737-2399
FAX: (559)734-8435

October 8, 2012 Lab ID : SP 1208765-002
Description : Stockdale East Customer ID : 2-24140

Sample Result - Organic

Constituent	Result	PQL	Units	Note	Sample Preparation		Sample Analysis	
					Method	Date/ID	Method	Date/ID
EPA 507[AGT:1]								
Propachlor	ND	1	ug/L		507	09/10/12:210043	507	09/19/12:213710
Simazine	ND	1	ug/L		507	09/10/12:210043	507	09/19/12:213710
Thiobencarb	ND	1	ug/L		507	09/10/12:210043	507	09/19/12:213710
Cyanazine	ND	0.5	ug/L		507	09/10/12:210043	507	09/19/12:213710
EPA 515[AGT:1]								
2,4-DCAA‡	102	70-130	%		515.3	09/11/12:210091	515.3	09/12/12:213356
Bentazon	ND	2	ug/L		515.3	09/11/12:210091	515.3	09/12/12:213680
2,4-D	ND	2	ug/L		515.3	09/11/12:210091	515.3	09/12/12:213680
Dalapon	ND	10	ug/L		515.3	09/11/12:210091	515.3	09/12/12:213680
Dicamba	ND	1	ug/L		515.3	09/11/12:210091	515.3	09/12/12:213680
Dinoseb	ND	1	ug/L		515.3	09/11/12:210091	515.3	09/12/12:213680
Pentachlorophenol	ND	0.2	ug/L		515.3	09/11/12:210091	515.3	09/12/12:213680
Picloram	ND	1	ug/L		515.3	09/11/12:210091	515.3	09/12/12:213680
2,4,5-TP (Silvex)	ND	1	ug/L		515.3	09/11/12:210091	515.3	09/12/12:213680
2,4,5-T	ND	1	ug/L		515.3	09/11/12:210091	515.3	09/12/12:213680
EPA 524.2[VOA:1'3]								
4-Bromofluorobenzene‡	88.9	70-130	%		524.2	08/30/12:209697	524.2	08/31/12:212822
1,2-Dichlorobenzene-d4‡	80.5	70-130	%		524.2	08/30/12:209697	524.2	08/31/12:212822
Benzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Bromobenzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Bromochloromethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Bromodichloromethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Bromoform	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Bromomethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
n-Butylbenzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
sec-Butylbenzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
tert-Butylbenzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Carbon Tetrachloride	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Chlorobenzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Chloroethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Chloroform	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Chloromethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
2-Chlorotoluene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
4-Chlorotoluene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Dibromochloromethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Dibromomethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
1,2-Dichlorobenzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
1,3-Dichlorobenzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822

October 8, 2012 Lab ID : SP 1208765-002
Description : Stockdale East Customer ID : 2-24140

Sample Result - Organic

Constituent	Result	PQL	Units	Note	Sample Preparation		Sample Analysis	
					Method	Date/ID	Method	Date/ID
EPA 524.2[VOA:1'3]								
1,4-Dichlorobenzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Dichlorodifluoromethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
1,1-Dichloroethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
1,2-Dichloroethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
1,1-Dichloroethylene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
cis-1,2-Dichloroethylene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
trans-1,2-Dichloroethylene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
1,2-Dichloropropane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
1,3-Dichloropropane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Dichloromethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
2,2-Dichloropropane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
1,1-Dichloropropene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
1,3-Dichloropropene (Total)	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
cis-1,3-Dichloropropene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
trans-1,3-Dichloropropene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Di-isopropyl ether (DIPE)	ND	3	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Ethyl Benzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Ethyl tert-Butyl Ether (ETBE)	ND	3	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Hexachlorobutadiene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Isopropylbenzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
p-Isopropyltoluene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Methyl tert-Butyl Ether (MTBE)	ND	1	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Naphthalene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
n-Propylbenzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Styrene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Tert-amyl-methyl Ether (TAME)	ND	3	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Tetrachloroethylene	1.4	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Toluene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
1,2,3-Trichlorobenzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
1,2,4-Trichlorobenzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
1,1,1-Trichloroethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
1,1,2-Trichloroethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Trichloroethylene	1.2	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Trichlorofluoromethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
1,1,2-Trichlorotrifluoroethane	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
1,2,4-Trimethylbenzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822

October 8, 2012 Lab ID : SP 1208765-002
Description : Stockdale East Customer ID : 2-24140

Sample Result - Organic

Constituent	Result	PQL	Units	Note	Sample Preparation		Sample Analysis	
					Method	Date/ID	Method	Date/ID
EPA 524.2[VOA:1'3]								
1,3,5-Trimethylbenzene	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Vinyl Chloride	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Xylenes (Total)	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Xylenes m,p	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Xylenes o	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
Total Trihalomethanes	ND	0.5	ug/L		524.2	08/30/12:209697	524.2	08/31/12:212822
EPA 531.1[AGT:1'8]								
Aldicarb	ND	3	ug/L		531.1	09/12/12:210149	531.1	09/13/12:213421
Aldicarb Sulfone	ND	2	ug/L		531.1	09/12/12:210149	531.1	09/13/12:213421
Aldicarb Sulfoxide	ND	3	ug/L		531.1	09/12/12:210149	531.1	09/13/12:213421
Carbaryl	ND	5	ug/L		531.1	09/12/12:210149	531.1	09/13/12:213421
Carbofuran	ND	5	ug/L		531.1	09/12/12:210149	531.1	09/13/12:213421
3-Hydroxycarbofuran	ND	3	ug/L		531.1	09/12/12:210149	531.1	09/13/12:213421
Methomyl	ND	2	ug/L		531.1	09/12/12:210149	531.1	09/13/12:213421
Oxamyl	ND	5	ug/L		531.1	09/12/12:210149	531.1	09/13/12:213421
EPA 547[AGT:1]								
Glyphosate	ND	20	ug/L		547	09/06/12:209907	547	09/06/12:213097
EPA 548.1[AGT:1]								
Endothall	ND	40	ug/L		548.1	09/05/12:209840	548.1	09/12/12:213471
EPA 549[AST:1]								
Diquat	ND	2	ug/L		549	09/04/12:209775	549.2	09/11/12:213332

ND=Non-Detected. PQL=Practical Quantitation Limit. Containers: (AGT) Amber Glass TFE-Cap, (AST) Amber Silanized-TFE, (P) Plastic, (VOA) VOA
Preservatives: Monochloracetic Buffer, H2SO4 pH < 2, NaOH, HNO3 pH < 2, HNO3 pH < 2, HCl pH < 2 ‡Surrogate. * PQL adjusted for dilution.

October 8, 2012

Lab ID : SP 1208765-002
Customer ID : 2-24140

Thomas Harder & Co.
801 E. Yorba Linda Blvd.
Suite 3a
Placentia, CA 92870

Sampled On : August 29, 2012-10:30
Sampled By : Andrew Hausheer
Received On : August 29, 2012-13:04
Matrix : Ground Water

Description : Stockdale East
Project : Stockdale East/West H20 Sampling

Sample Result - Radio

Constituent	Result ± Error	MDA	Units	MCL/AL	Sample Preparation Method	Sample Preparation Date/ID	Sample Analysis Method	Sample Analysis Date/ID
Radio Chemistry[P:1]								
Gross Alpha	15.0 ± 2.54	1.18	pCi/L	15/5	900.0	09/11/12-09:00 2P1209973	900.0	09/11/12-14:30 2A1213451
Uranium	10.9 ± 1.95	0.439	pCi/L	20	908.0	09/17/12-08:10 2P1210277	908.0	09/19/12-15:40 2A1213936

ND=Non-Detected. PQL=Practical Quantitation Limit. Containers: (AGT) Amber Glass TFE-Cap, (AST) Amber Silanized-TFE, (P) Plastic, (VOA) VOA
Preservatives: Monochloracetic Buffer, H2SO4 pH < 2, NaOH, HNO3 pH < 2, HNO3 pH < 2, HCl pH < 2 * PQL adjusted for dilution.

MDA = Minimum Detectable Activity (Calculated at the 95% confidence level) = Data utilized by DHS to determine matrix interference.
MCL / AL = Maximum Contamination Level / Action Level. Alpha's Action Level of 5 pCi/L is based on the Assigned Value (AV).
AV = Assigned Value(Gross Alpha Result + (0.84 x Error)). CCR Section 64442: Drinking Water Compliance Note: Do the following
If Gross Alpha's (AV) exceeds 5 pCi/L run Uranium. If Gross Alpha's (AV) minus Uranium exceeds 5 pCi/L run Radium 226.

Drinking Water Compliance:
Gross Alpha (AV) minus Uranium is less than or equal to 15 pCi/L
Uranium is less than or equal to 20 pCi/L
Radium 226 + Radium 228 is less than or equal to 5 pCi/L

Note: Samples are held for 3-6 months prior to disposal.

Corporate Offices & Laboratory
853 Corporation Street
Santa Paula, CA 93060
TEL: (805)392-2000
Env FAX: (805)525-4172 / Ag FAX: (805)392-2063
CA NELAP Certification No. 01110CA

Office & Laboratory
2500 Stagecoach Road
Stockton, CA 95215
TEL: (209)942-0182
FAX: (209)942-0423
CA ELAP Certification No. 1563

Office & Laboratory
563 E. Lindo Avenue
Chico, CA 95926
TEL: (530)343-5818
FAX: (530)343-3807
CA ELAP Certification No. 2670

Office & Laboratory
3442 Empresa Drive, Suite D
San Luis Obispo, CA 93401
TEL: (805)783-2940
FAX: (805)525-4172
CA ELAP Certification No. 2775

Field Office
Visalia, California
TEL: (559)734-9473
Mobile: (559)737-2399
FAX: (559)734-8435

October 8, 2012 Lab ID :SP 1208765-001
Thomas Harder & Co. Description : Stockdale West

Drinking Water Interpretation

Summary: Your water has a failure for one or more items on this sample report. Please see the table below to determine which items failed. Following the table is a brief explanation describing the significance of the failure and whether treatment may be required.

CONSTITUENT	RESULT	UNITS	MCL	MCL	
				LESS OR EQUAL	EXCEED
Inorganic - Primary					
Aluminum	20	ug/L	1000	Pass	
Antimony	ND	ug/L	6	Pass	
Arsenic	ND	ug/L	10	Pass	
Barium	43.1	ug/L	1000	Pass	
Beryllium	ND	ug/L	4	Pass	
Cadmium	ND	ug/L	5	Pass	
Chromium	ND	ug/L	50	Pass	
Color	ND	units	15	Pass	
Cyanide, Total	ND	mg/L	0.15	Pass	
Fluoride	ND	mg/L	2	Pass	
Mercury	ND	ug/L	2	Pass	
Nickel	ND	ug/L	100	Pass	
Nitrate	13.4	mg/L	45	Pass	
Nitrate + Nitrite as N	3.0	mg/L	10	Pass	
Nitrite as N	ND	mg/L	1	Pass	
Odor	ND	TON	3	Pass	
Perchlorate	ND	ug/L	6	Pass	
Selenium	ND	ug/L	50	Pass	
Thallium	ND	ug/L	2	Pass	
Turbidity	1.6	NTU	5	Pass	
Inorganic - Secondary					
Aluminum	20	ug/L	200	Pass	
Chloride	81	mg/L	500	Pass	
Copper	ND	ug/L	1000	Pass	
Iron	ND	ug/L	300	Pass	
Manganese	ND	ug/L	50	Pass	
MBAS (foaming agents)	ND	mg/L	0.5	Pass	
Silver	ND	ug/L	100	Pass	
Specific Conductance	590	umhos/cm	1600	Pass	
Sulfate	36	mg/L	500	Pass	

October 8, 2012 Lab ID :SP 1208765-001
Thomas Harder & Co. Description : Stockdale West

Drinking Water Interpretation

CONSTITUENT	RESULT	UNITS	MCL	MCL LESS OR EQUAL	MCL EXCEED
Inorganic - Secondary					
Total Dissolved Solids	400	mg/L	1000	Pass	
Organic - Primary					
1,1,1-Trichloroethane	ND	ug/L	200	Pass	
1,1,2,2-Tetrachloroethane	ND	ug/L	1	Pass	
1,1,2-Trichloroethane	ND	ug/L	5	Pass	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1200	Pass	
1,1-Dichloroethane	ND	ug/L	5	Pass	
1,1-Dichloroethylene	ND	ug/L	6	Pass	
1,2,4-Trichlorobenzene	ND	ug/L	5	Pass	
1,2-Dichlorobenzene	ND	ug/L	600	Pass	
1,2-Dichloroethane	ND	ug/L	0.5	Pass	
1,2-Dichloropropane	ND	ug/L	5	Pass	
1,3-Dichloropropene (Total)	ND	ug/L	0.5	Pass	
1,4-Dichlorobenzene	ND	ug/L	5	Pass	
2,4,5-TP (Silvex)	ND	ug/L	50	Pass	
2,4-D	ND	ug/L	70	Pass	
Alachlor	ND	ug/L	2	Pass	
Aldicarb	ND	ug/L	# 3	Pass	
Aldicarb Sulfone	ND	ug/L	# 2	Pass	
Aldicarb Sulfoxide	ND	ug/L	# 4	Pass	
Atrazine	ND	ug/L	1	Pass	
Bentazon	ND	ug/L	18	Pass	
Benzene	ND	ug/L	1	Pass	
Carbofuran	ND	ug/L	18	Pass	
Carbon Tetrachloride	ND	ug/L	0.5	Pass	
Chlordane	ND	ug/L	0.1	Pass	
Chlorobenzene	ND	ug/L	70	Pass	
cis-1,2-Dichloroethylene	ND	ug/L	6	Pass	
cis-1,3-Dichloropropene	ND	ug/L	0.5	Pass	
Dalapon	ND	ug/L	200	Pass	
DBCP	ND	ug/L	0.2	Pass	
Dichloromethane	ND	ug/L	5	Pass	
Dinoseb	ND	ug/L	7	Pass	
Diquat	ND	ug/L	20	Pass	
EDB	0.02	ug/L	0.05	Pass	
Endothall	ND	ug/L	100	Pass	

October 8, 2012 Lab ID :SP 1208765-001
Thomas Harder & Co. Description : Stockdale West

Drinking Water Interpretation

CONSTITUENT	RESULT	UNITS	MCL	MCL LESS OR EQUAL	MCL EXCEED
Organic - Primary					
Endrin	ND	ug/L	2	Pass	
Ethyl Benzene	ND	ug/L	300	Pass	
Glyphosate	ND	ug/L	700	Pass	
Heptachlor	ND	ug/L	0.01	Pass	
Heptachlor Epoxide	ND	ug/L	0.01	Pass	
Hexachlorobenzene	ND	ug/L	1	Pass	
Hexachlorocyclopentadiene	ND	ug/L	50	Pass	
Lindane (Gamma NHC)	ND	ug/L	0.2	Pass	
Methoxychlor	ND	ug/L	30	Pass	
Methyl tert-Butyl Ether (MTBE)	ND	ug/L	13	Pass	
Molinate	ND	ug/L	20	Pass	
Oxamyl	ND	ug/L	50	Pass	
PCB 1016	ND	ug/L	0.5	Pass	
PCB 1221	ND	ug/L	0.5	Pass	
PCB 1232	ND	ug/L	0.5	Pass	
PCB 1242	ND	ug/L	0.5	Pass	
PCB 1248	ND	ug/L	0.5	Pass	
PCB 1254	ND	ug/L	0.5	Pass	
PCB 1260	ND	ug/L	0.5	Pass	
Pentachlorophenol	ND	ug/L	1	Pass	
Picloram	ND	ug/L	500	Pass	
Simazine	ND	ug/L	4	Pass	
Styrene	ND	ug/L	100	Pass	
Tetrachloroethylene	ND	ug/L	5	Pass	
Toluene	ND	ug/L	150	Pass	
Total Trihalomethanes	ND	ug/L	80	Pass	
Toxaphene	ND	ug/L	3	Pass	
trans-1,2-Dichloroethylene	ND	ug/L	10	Pass	
trans-1,3-Dichloropropene	ND	ug/L	0.5	Pass	
Trichloroethylene	ND	ug/L	5	Pass	
Trichlorofluoromethane	ND	ug/L	150	Pass	
Vinyl Chloride	ND	ug/L	0.5	Pass	
Xylenes (Total)	ND	ug/L	1750	Pass	
Xylenes m,p	ND	ug/L	1750	Pass	
Xylenes o	ND	ug/L	1750	Pass	

October 8, 2012 Lab ID :SP 1208765-001
Thomas Harder & Co. Description : Stockdale West

Drinking Water Interpretation

CONSTITUENT	RESULT	UNITS	MCL	MCL LESS OR EQUAL	MCL EXCEED
Organic - Secondary					
Thiobencarb	ND	ug/L	70	Pass	
Other					
Copper	ND	ug/L	1300***	Pass	
Radio - Primary					
Gross Alpha	18.9	pCi/L	15 □		Fail
Uranium	10.2	pCi/L	20	Pass	

ND=Non-Detected. * Including Radium but excluding Uranium. (Ref. Title 22 sec. 64441.) *** Federal Action Level Title 22, Section 64672.3

MCL: **The maximum level at which a constituent may be present and be considered acceptable for potability or aesthetics.**

Primary: **Items listed as primary are regulated because of health concerns. If there is a failure for a primary constituent treatment is normally required.**

Secondary: **Items listed as secondary are regulated because they may adversely affect the taste, odor or appearance of drinking water. They are not directly health related. If there is a failure for a secondary constituent on a small public water system it is best to consult your regulator to determine if treatment is required. A secondary constituent failure for a private water system does not require treatment. However, the owner may wish to treat the water in order to improve the quality.**

Treatment: **If your water requires treatment we suggest that you contact a qualified water treatment company. They are normally listed in the yellow pages under the following topics:**

Water Purification & Filtration Equipment
Water Softening & Conditioning Equipment
Water Treatment Equipment

October 8, 2012 Lab ID :SP 1208765-002
Thomas Harder & Co. Description : Stockdale East

Drinking Water Interpretation

Summary: Your Water was acceptable for all items tested on this sample report. Details are presented below:

CONSTITUENT	RESULT	UNITS	MCL	MCL LESS OR EQUAL	MCL EXCEED
Inorganic - Primary					
Aluminum	ND	ug/L	1000	Pass	
Antimony	ND	ug/L	6	Pass	
Arsenic	ND	ug/L	10	Pass	
Barium	70.2	ug/L	1000	Pass	
Beryllium	ND	ug/L	4	Pass	
Cadmium	ND	ug/L	5	Pass	
Chromium	ND	ug/L	50	Pass	
Color	ND	units	15	Pass	
Cyanide, Total	ND	mg/L	0.15	Pass	
Fluoride	ND	mg/L	2	Pass	
Mercury	ND	ug/L	2	Pass	
Nickel	ND	ug/L	100	Pass	
Nitrate	14.4	mg/L	45	Pass	
Nitrate + Nitrite as N	3.2	mg/L	10	Pass	
Nitrite as N	ND	mg/L	1	Pass	
Odor	ND	TON	3	Pass	
Perchlorate	ND	ug/L	6	Pass	
Selenium	ND	ug/L	50	Pass	
Thallium	ND	ug/L	2	Pass	
Turbidity	ND	NTU	5	Pass	
Inorganic - Secondary					
Aluminum	ND	ug/L	200	Pass	
Chloride	51	mg/L	500	Pass	
Copper	ND	ug/L	1000	Pass	
Iron	ND	ug/L	300	Pass	
Manganese	ND	ug/L	50	Pass	
MBAS (foaming agents)	ND	mg/L	0.5	Pass	
Silver	ND	ug/L	100	Pass	
Specific Conductance	469	umhos/cm	1600	Pass	
Sulfate	34	mg/L	500	Pass	

October 8, 2012 Lab ID :SP 1208765-002
Thomas Harder & Co. Description : Stockdale East

Drinking Water Interpretation

CONSTITUENT	RESULT	UNITS	MCL	MCL LESS OR EQUAL	MCL EXCEED
Inorganic - Secondary					
Total Dissolved Solids	280	mg/L	1000	Pass	
Organic - Primary					
1,1,1-Trichloroethane	ND	ug/L	200	Pass	
1,1,2,2-Tetrachloroethane	ND	ug/L	1	Pass	
1,1,2-Trichloroethane	ND	ug/L	5	Pass	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1200	Pass	
1,1-Dichloroethane	ND	ug/L	5	Pass	
1,1-Dichloroethylene	ND	ug/L	6	Pass	
1,2,4-Trichlorobenzene	ND	ug/L	5	Pass	
1,2-Dichlorobenzene	ND	ug/L	600	Pass	
1,2-Dichloroethane	ND	ug/L	0.5	Pass	
1,2-Dichloropropane	ND	ug/L	5	Pass	
1,3-Dichloropropene (Total)	ND	ug/L	0.5	Pass	
1,4-Dichlorobenzene	ND	ug/L	5	Pass	
2,4,5-TP (Silvex)	ND	ug/L	50	Pass	
2,4-D	ND	ug/L	70	Pass	
Alachlor	ND	ug/L	2	Pass	
Aldicarb	ND	ug/L	# 3	Pass	
Aldicarb Sulfone	ND	ug/L	# 2	Pass	
Aldicarb Sulfoxide	ND	ug/L	# 4	Pass	
Atrazine	ND	ug/L	1	Pass	
Bentazon	ND	ug/L	18	Pass	
Benzene	ND	ug/L	1	Pass	
Carbofuran	ND	ug/L	18	Pass	
Carbon Tetrachloride	ND	ug/L	0.5	Pass	
Chlordane	ND	ug/L	0.1	Pass	
Chlorobenzene	ND	ug/L	70	Pass	
cis-1,2-Dichloroethylene	ND	ug/L	6	Pass	
cis-1,3-Dichloropropene	ND	ug/L	0.5	Pass	
Dalapon	ND	ug/L	200	Pass	
DBCP	ND	ug/L	0.2	Pass	
Dichloromethane	ND	ug/L	5	Pass	
Dinoseb	ND	ug/L	7	Pass	
Diquat	ND	ug/L	20	Pass	
EDB	ND	ug/L	0.05	Pass	
Endothall	ND	ug/L	100	Pass	

October 8, 2012 Lab ID :SP 1208765-002
Thomas Harder & Co. Description : Stockdale East

Drinking Water Interpretation

CONSTITUENT	RESULT	UNITS	MCL	MCL LESS OR EQUAL	MCL EXCEED
Organic - Primary					
Endrin	ND	ug/L	2	Pass	
Ethyl Benzene	ND	ug/L	300	Pass	
Glyphosate	ND	ug/L	700	Pass	
Heptachlor	ND	ug/L	0.01	Pass	
Heptachlor Epoxide	ND	ug/L	0.01	Pass	
Hexachlorobenzene	ND	ug/L	1	Pass	
Hexachlorocyclopentadiene	ND	ug/L	50	Pass	
Lindane (Gamma NHC)	ND	ug/L	0.2	Pass	
Methoxychlor	ND	ug/L	30	Pass	
Methyl tert-Butyl Ether (MTBE)	ND	ug/L	13	Pass	
Molinate	ND	ug/L	20	Pass	
Oxamyl	ND	ug/L	50	Pass	
PCB 1016	ND	ug/L	0.5	Pass	
PCB 1221	ND	ug/L	0.5	Pass	
PCB 1232	ND	ug/L	0.5	Pass	
PCB 1242	ND	ug/L	0.5	Pass	
PCB 1248	ND	ug/L	0.5	Pass	
PCB 1254	ND	ug/L	0.5	Pass	
PCB 1260	ND	ug/L	0.5	Pass	
Pentachlorophenol	ND	ug/L	1	Pass	
Picloram	ND	ug/L	500	Pass	
Simazine	ND	ug/L	4	Pass	
Styrene	ND	ug/L	100	Pass	
Tetrachloroethylene	1.4	ug/L	5	Pass	
Toluene	ND	ug/L	150	Pass	
Total Trihalomethanes	ND	ug/L	80	Pass	
Toxaphene	ND	ug/L	3	Pass	
trans-1,2-Dichloroethylene	ND	ug/L	10	Pass	
trans-1,3-Dichloropropene	ND	ug/L	0.5	Pass	
Trichloroethylene	1.2	ug/L	5	Pass	
Trichlorofluoromethane	ND	ug/L	150	Pass	
Vinyl Chloride	ND	ug/L	0.5	Pass	
Xylenes (Total)	ND	ug/L	1750	Pass	
Xylenes m,p	ND	ug/L	1750	Pass	
Xylenes o	ND	ug/L	1750	Pass	

October 8, 2012 Lab ID :SP 1208765-002
Thomas Harder & Co. Description : Stockdale East

Drinking Water Interpretation

CONSTITUENT	RESULT	UNITS	MCL	MCL LESS OR EQUAL	MCL EXCEED
Organic - Secondary					
Thiobencarb	ND	ug/L	70	Pass	
Other					
Copper	ND	ug/L	1300***	Pass	
Radio - Primary					
Gross Alpha	15.0	pCi/L	15 □	Pass	
Uranium	10.9	pCi/L	20	Pass	

ND=Non-Detected. * Including Radium but excluding Uranium. (Ref. Title 22 sec. 64441.) *** Federal Action Level Title 22, Section 64672.3

MCL: **The maximum level at which a constituent may be present and be considered acceptable for potability or aesthetics.**

Primary: **Items listed as primary are regulated because of health concerns. If there is a failure for a primary constituent treatment is normally required.**

Secondary: **Items listed as secondary are regulated because they may adversely affect the taste, odor or appearance of drinking water. They are not directly health related. If there is a failure for a secondary constituent on a small public water system it is best to consult your regulator to determine if treatment is required. A secondary constituent failure for a private water system does not require treatment. However, the owner may wish to treat the water in order to improve the quality.**

Treatment: **If your water requires treatment we suggest that you contact a qualified water treatment company. They are normally listed in the yellow pages under the following topics:**

Water Purification & Filtration Equipment
Water Softening & Conditioning Equipment
Water Treatment Equipment

October 8, 2012 Lab ID : SP 1208765
Thomas Harder & Co. Customer : 2-24140

Quality Control - Organic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Organic								
1,2-Dibromoethane(EDB)	504	09/04/12:209780SBL	Blank	ug/L		ND	<0.02	
			LCS	ug/L	0.2950	108 %	70-130	
			MS	ug/L	0.2950	103 %	70-130	
		(SP 1208753-001)	MSD	ug/L	0.2950	107 %	70-130	
			MSRPD	ug/L	0.5868	4.6%	≤30	
1,3-Dibromopropane	504	09/04/12:209780SBL	Blank	ug/L	0.5868	97.4 %	70-130	
			LCS	ug/L	0.5868	94.7 %	70-130	
			MS	ug/L	0.5868	91.6 %	70-130	
		(SP 1208753-001)	MSD	ug/L	0.5868	95.1 %	70-130	
			MSRPD	ug/L	0.5868	3.8%	≤30	
DBCP	504	09/04/12:209780SBL	Blank	ug/L		ND	<0.01	
			LCS	ug/L	0.2950	96.3 %	70-130	
			MS	ug/L	0.2950	94.3 %	70-130	
		(SP 1208753-001)	MSD	ug/L	0.2950	97.7 %	70-130	
			MSRPD	ug/L	0.5868	3.5%	≤30	
13DBP	504.1	09/05/12:213041SBL	CCV	ug/L	7.481	102 %	70-130	
			CCV	ug/L	9.975	99.1 %	70-130	
DBCP	504.1	09/05/12:213041SBL	CCV	ug/L	2.006	91.7 %	70-130	
			CCV	ug/L	5.015	99.1 %	70-130	
EDB	504.1	09/05/12:213041SBL	CCV	ug/L	2.006	98.7 %	70-130	
			CCV	ug/L	5.015	113 %	70-130	
Alachlor	505	09/12/12:210104VRG	Blank	ug/L		ND	<0.2	
			LCS	ug/L	5.882	105 %	22-186	
			MS	ug/L	5.882	103 %	31-168	
		(SP 1208765-001)	MSD	ug/L	5.882	103 %	31-168	
			MSRPD	ug/L	5.882	0.3%	≤28.7	
	505	09/13/12:213456VRG	CCV	ug/L	150.0	101 %	70-130	
			CCV	ug/L	100.0	102 %	70-130	
Aldrin	505	09/12/12:210104VRG	Blank	ug/L		ND	<0.01	
			LCS	ug/L	0.5882	97.8 %	2-254	
			MS	ug/L	0.5882	105 %	2-246	
		(SP 1208765-001)	MSD	ug/L	0.5882	106 %	2-246	
			MSRPD	ug/L	5.882	0.9%	≤50.6	
	505	09/13/12:213456VRG	CCV	ug/L	15.00	102 %	70-130	
			CCV	ug/L	10.00	100 %	70-130	
Chlordane	505	09/12/12:210104VRG	Blank	ug/L		ND	<0.1	
Dieldrin	505	09/12/12:210104VRG	Blank	ug/L		ND	<0.01	
			LCS	ug/L	0.5882	103 %	24-193	
			MS	ug/L	0.5882	100 %	36-175	
		(SP 1208765-001)	MSD	ug/L	0.5882	99.9 %	36-175	
			MSRPD	ug/L	5.882	0.5%	≤5.55	
	505	09/13/12:213456VRG	CCV	ug/L	15.00	96.7 %	70-130	
			CCV	ug/L	10.00	96.7 %	70-130	
Endrin	505	09/12/12:210104VRG	Blank	ug/L		ND	<0.01	
			LCS	ug/L	0.5882	90.2 %	22-200	
			MS	ug/L	0.5882	79.2 %	36-180	
		(SP 1208765-001)	MSD	ug/L	0.5882	73.9 %	36-180	
			MSRPD	ug/L	5.882	6.9%	≤8.81	
	505	09/13/12:213456VRG	CCV	ug/L	15.00	91.1 %	70-130	
			CCV	ug/L	10.00	71.2 %	70-130	
Heptachlor	505	09/12/12:210104VRG	Blank	ug/L		ND	<0.01	
			LCS	ug/L	0.5882	101 %	16-216	
			MS	ug/L	0.5882	105 %	33-194	
		(SP 1208765-001)	MSD	ug/L	0.5882	106 %	33-194	
			MSRPD	ug/L	5.882	0.4%	≤11.9	

Corporate Offices & Laboratory
853 Corporation Street
Santa Paula, CA 93060
TEL: (805)392-2000
Env FAX: (805)525-4172 / Ag FAX: (805)392-2063
CA NELAP Certification No. 01110CA

Office & Laboratory
2500 Stagecoach Road
Stockton, CA 95215
TEL: (209)942-0182
FAX: (209)942-0423
CA ELAP Certification No. 1563

Office & Laboratory
563 E. Lindo Avenue
Chico, CA 95926
TEL: (530)343-5818
FAX: (530)343-3807
CA ELAP Certification No. 2670

Office & Laboratory
3442 Empresa Drive, Suite D
San Luis Obispo, CA 93401
TEL: (805)783-2940
FAX: (805)525-4172
CA ELAP Certification No. 2775

Field Office
Visalia, California
TEL: (559)734-9473
Mobile: (559)737-2399
FAX: (559)734-8435

October 8, 2012 Lab ID : SP 1208765
Thomas Harder & Co. Customer : 2-24140

Quality Control - Organic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Organic								
Heptachlor	505	09/13/12:213456VRG	CCV	ug/L	15.00	98.7 %	70-130	
			CCV	ug/L	10.00	95.7 %	70-130	
Heptachlor Epoxide	505	09/12/12:210104VRG	Blank	ug/L		ND	<0.01	
			LCS	ug/L	0.5882	103 %	23-199	
			MS	ug/L	0.5882	102 %	35-180	
		(SP 1208765-001)	MSD	ug/L	0.5882	100 %	35-180	
			MSRPD	ug/L	5.882	1.3%	≤8.09	
	505	09/13/12:213456VRG	CCV	ug/L	15.00	99.7 %	70-130	
			CCV	ug/L	10.00	98.4 %	70-130	
Hexachlorobenzene	505	09/12/12:210104VRG	Blank	ug/L		ND	<0.01	
			LCS	ug/L	0.5882	103 %	19-218	
			MS	ug/L	0.5882	103 %	37-193	
		(SP 1208765-001)	MSD	ug/L	0.5882	106 %	37-193	
			MSRPD	ug/L	5.882	2.7%	≤10.8	
	505	09/13/12:213456VRG	CCV	ug/L	15.00	96.4 %	70-130	
			CCV	ug/L	10.00	94.9 %	70-130	
Hexachlorocyclopentadiene	505	09/12/12:210104VRG	Blank	ug/L		ND	<0.1	
			LCS	ug/L	0.5882	97.0 %	17-284	
			MS	ug/L	0.5882	107 %	17-266	
		(SP 1208765-001)	MSD	ug/L	0.5882	106 %	17-266	
			MSRPD	ug/L	5.882	0.8%	≤16.7	
	505	09/13/12:213456VRG	CCV	ug/L	15.00	113 %	70-130	
			CCV	ug/L	10.00	110 %	70-130	
Lindane	505	09/12/12:210104VRG	Blank	ug/L		ND	<0.05	
			LCS	ug/L	0.5882	103 %	55-167	
			MS	ug/L	0.5882	99.8 %	65-154	
		(SP 1208765-001)	MSD	ug/L	0.5882	99.3 %	65-154	
			MSRPD	ug/L	5.882	0.5%	≤4.98	
	505	09/13/12:213456VRG	CCV	ug/L	15.00	164 %	70-130	360
			CCV	ug/L	10.00	157 %	70-130	360
Methoxychlor	505	09/12/12:210104VRG	Blank	ug/L		ND	<0.1	
			LCS	ug/L	2.941	104 %	2-249	
			MS	ug/L	2.941	97.6 %	2-237	
		(SP 1208765-001)	MSD	ug/L	2.941	96.2 %	2-237	
			MSRPD	ug/L	5.882	1.5%	≤7.94	
	505	09/13/12:213456VRG	CCV	ug/L	75.00	102 %	70-130	
			CCV	ug/L	50.00	97.4 %	70-130	
PCB 1016/1242 - 1	505	09/12/12:210104VRG	Blank	ug/L		ND	<0.5	
PCB 1221 - 1	505	09/12/12:210104VRG	Blank	ug/L		ND	<0.5	
PCB 1232 - 1	505	09/12/12:210104VRG	Blank	ug/L		ND	<0.5	
PCB 1242	505	09/12/12:210104VRG	Blank	ug/L		ND	<0.5	
PCB 1248 - 1	505	09/12/12:210104VRG	Blank	ug/L		ND	<0.5	
PCB 1254 - 1	505	09/12/12:210104VRG	Blank	ug/L		ND	<0.5	
PCB 1260 - 1	505	09/12/12:210104VRG	Blank	ug/L		ND	<0.5	
Toxaphene	505	09/12/12:210104VRG	Blank	ug/L		ND	<0.5	
Alachlor	507	09/10/12:210043CCG	Blank	ug/L		ND	<1	
			LCS	ug/L	2.500	108 %	70-130	
			MS	ug/L	2.500	63.5 %	55-233	
		(VI 1242091-001)	MSD	ug/L	2.500	116 %	55-233	
			MSRPD	ug/L	12.50	1.3	≤1	435
	507	09/19/12:213710SG	CCV	ug/L	500.0	109 %	80-120	
			CCV	ug/L	1000	102 %	80-120	
Atrazine	507	09/10/12:210043CCG	Blank	ug/L		ND	<0.5	
			LCS	ug/L	2.500	90.3 %	70-130	

October 8, 2012 Lab ID : SP 1208765
Thomas Harder & Co. Customer : 2-24140

Quality Control - Organic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Organic								
Atrazine	507		MS	ug/L	2.500	63.1 %	50-245	
		(VI 1242091-001)	MSD	ug/L	2.500	97.3 %	50-245	
			MSRPD	ug/L	12.50	0.86	≤0.5	435
	507	09/19/12:213710SG	CCV	ug/L	500.0	101 %	80-120	
			CCV	ug/L	1000	102 %	80-120	
Bromacil	507	09/10/12:210043CCG	Blank	ug/L		ND	<2	
			LCS	ug/L	2.500	114 %	70-130	
			MS	ug/L	2.500	86.6 %	47-250	
		(VI 1242091-001)	MSD	ug/L	2.500	102 %	47-250	
			MSRPD	ug/L	12.50	0.39	≤2	
	507	09/19/12:213710SG	CCV	ug/L	500.0	113 %	80-120	
			CCV	ug/L	1000	107 %	80-120	
Butachlor	507	09/10/12:210043CCG	Blank	ug/L		ND	<1	
			LCS	ug/L	2.500	106 %	70-130	
			MS	ug/L	2.500	81.9 %	42-244	
		(VI 1242091-001)	MSD	ug/L	2.500	97.0 %	42-244	
			MSRPD	ug/L	12.50	0.38	≤1	
	507	09/19/12:213710SG	CCV	ug/L	500.0	106 %	80-120	
			CCV	ug/L	1000	111 %	80-120	
Cyanazine	507	09/10/12:210043CCG	Blank	ug/L		ND	<0.5	
			LCS	ug/L	2.500	75.4 %	70-130	
			MS	ug/L	2.500	50.0 %	41-246	
		(VI 1242091-001)	MSD	ug/L	2.500	116 %	41-246	
			MSRPD	ug/L	12.50	1.6	≤0.5	435
	507	09/19/12:213710SG	CCV	ug/L	500.0	104 %	80-120	
			CCV	ug/L	1000	113 %	80-120	
Diazinon	507	09/10/12:210043CCG	Blank	ug/L		ND	<2	
			LCS	ug/L	2.500	100 %	70-130	
			MS	ug/L	2.500	59.2 %	57-212	
		(VI 1242091-001)	MSD	ug/L	2.500	91.3 %	57-212	
			MSRPD	ug/L	12.50	0.80	≤2	
	507	09/19/12:213710SG	CCV	ug/L	500.0	98.5 %	80-120	
			CCV	ug/L	1000	97.9 %	80-120	
Dimethoate	507	09/10/12:210043CCG	Blank	ug/L		ND	<2	
			LCS	ug/L	2.500	80.9 %	70-130	
			MS	ug/L	2.500	63.1 %	55-246	
		(VI 1242091-001)	MSD	ug/L	2.500	105 %	55-246	
			MSRPD	ug/L	12.50	1.1	≤2	
	507	09/19/12:213710SG	CCV	ug/L	500.0	105 %	80-120	
			CCV	ug/L	1000	107 %	80-120	
EPN/Triphenylphosphate	507	09/10/12:210043CCG	Blank	ug/L	12.50	82.0 %	70-130	
			LCS	ug/L	12.50	75.9 %	70-130	
			MS	ug/L	12.50	48.9 %	70-130	435
		(VI 1242091-001)	MSD	ug/L	12.50	69.5 %	70-130	
			MSRPD	ug/L	12.50	34.8%	≤N/A	
Metolachlor	507	09/10/12:210043CCG	Blank	ug/L		ND	<1	
			LCS	ug/L	2.500	94.9 %	70-130	
			MS	ug/L	2.500	46.9 %	53-235	435
		(VI 1242091-001)	MSD	ug/L	2.500	79.6 %	53-235	
			MSRPD	ug/L	12.50	0.82	≤1	
	507	09/19/12:213710SG	CCV	ug/L	500.0	119 %	80-120	
			CCV	ug/L	1000	98.0 %	80-120	
Metribuzin	507	09/10/12:210043CCG	Blank	ug/L		ND	<0.5	
			LCS	ug/L	2.500	101 %	70-130	

October 8, 2012 Lab ID : SP 1208765
Thomas Harder & Co. Customer : 2-24140

Quality Control - Organic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Organic								
Metribuzin	507		MS	ug/L	2.500	50.1 %	49-260	
		(VI 1242091-001)	MSD	ug/L	2.500	95.6 %	49-260	
			MSRPD	ug/L	12.50	1.1	≤0.5	435
	507	09/19/12:213710SG	CCV	ug/L	500.0	98.7 %	80-120	
			CCV	ug/L	1000	107 %	80-120	
Molinate	507	09/10/12:210043CCG	Blank	ug/L		ND	<2	
			LCS	ug/L	2.500	89.9 %	70-130	
			MS	ug/L	2.500	61.4 %	20-299	
		(VI 1242091-001)	MSD	ug/L	2.500	104 %	20-299	
			MSRPD	ug/L	12.50	1.1	≤2	
	507	09/19/12:213710SG	CCV	ug/L	500.0	98.1 %	80-120	
			CCV	ug/L	1000	97.3 %	80-120	
Prometryne	507	09/10/12:210043CCG	Blank	ug/L		ND	<2	
			LCS	ug/L	2.500	104 %	70-130	
			MS	ug/L	2.500	57.8 %	52-241	
		(VI 1242091-001)	MSD	ug/L	2.500	91.4 %	52-241	
			MSRPD	ug/L	12.50	0.84	≤2	
	507	09/19/12:213710SG	CCV	ug/L	500.0	107 %	80-120	
			CCV	ug/L	1000	104 %	80-120	
Propachlor	507	09/10/12:210043CCG	Blank	ug/L		ND	<1	
			LCS	ug/L	2.500	95.4 %	70-130	
			MS	ug/L	2.500	81.4 %	34-270	
		(VI 1242091-001)	MSD	ug/L	2.500	123 %	34-270	
			MSRPD	ug/L	12.50	1.0	≤1	
	507	09/19/12:213710SG	CCV	ug/L	500.0	105 %	80-120	
			CCV	ug/L	1000	116 %	80-120	
Simazine	507	09/10/12:210043CCG	Blank	ug/L		ND	<1	
			LCS	ug/L	2.500	87.2 %	70-130	
			MS	ug/L	2.500	62.3 %	51-255	
		(VI 1242091-001)	MSD	ug/L	2.500	102 %	51-255	
			MSRPD	ug/L	12.50	0.98	≤1	
	507	09/19/12:213710SG	CCV	ug/L	500.0	110 %	80-120	
			CCV	ug/L	1000	104 %	80-120	
Thiobencarb	507	09/10/12:210043CCG	Blank	ug/L		ND	<1	
			LCS	ug/L	2.500	85.0 %	70-130	
			MS	ug/L	2.500	63.3 %	55-227	
		(VI 1242091-001)	MSD	ug/L	2.500	88.9 %	55-227	
			MSRPD	ug/L	12.50	0.64	≤1	
	507	09/19/12:213710SG	CCV	ug/L	500.0	92.4 %	80-120	
			CCV	ug/L	1000	94.4 %	80-120	
Triphenylphosphate	507	09/19/12:213710SG	CCV	ug/L	2500	112 %	80-120	
			CCV	ug/L	7500	112 %	80-120	
2,4,5-T	515.3	09/12/12:213680VRG	CCV	ug/L	10.00	361 %	70-130	360
			CCV	ug/L	10.00	362 %	70-130	360
2,4,5-TP (Silvex)	515.3	09/11/12:210091VRG	Blank	ug/L		ND	<1	
			LCS	ug/L	4.000	114 %	70-130	
			MS	ug/L	4.000	99.1 %	70-130	
		(VI 1242142-001)	MSD	ug/L	4.000	98.0 %	70-130	
			MSRPD	ug/L	20.00	0.046	≤1	
	515.3	09/12/12:213680VRG	CCV	ug/L	10.00	367 %	70-130	360
			CCV	ug/L	10.00	398 %	70-130	360
2,4,5-Trichlorophenoxyacetic A	515.3	09/11/12:210091VRG	Blank	ug/L		ND	<1	
			LCS	ug/L	4.000	107 %	70-130	
			MS	ug/L	4.000	96.4 %	70-130	

October 8, 2012 Lab ID : SP 1208765
Thomas Harder & Co. Customer : 2-24140

Quality Control - Organic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Organic								
2,4,5-Trichlorophenoxyacetic A	515.3	(VI 1242142-001)	MSD	ug/L	4.000	103 %	70-130	
			MSRPD	ug/L	20.00	0.26	≤1	
2,4-D	515.3	09/11/12:210091VRG	Blank	ug/L		ND	<2	
			LCS	ug/L	8.000	107 %	70-130	
			MS	ug/L	8.000	91.6 %	70-130	
		(VI 1242142-001)	MSD	ug/L	8.000	92.6 %	70-130	
			MSRPD	ug/L	20.00	0.079	≤2	
	515.3	09/12/12:213680VRG	CCV	ug/L	20.00	362 %	70-130	360
			CCV	ug/L	20.00	383 %	70-130	360
2,4-DCAA	515.3	09/11/12:210091VRG	Blank	ug/L	20.00	119 %	70-130	
			LCS	ug/L	20.00	92.9 %	70-130	
			MS	ug/L	20.00	89.6 %	N/A	
		(VI 1242142-001)	MSD	ug/L	20.00	93.9 %	N/A	
			MSRPD	ug/L	20.00	4.6%	≤30.	
	515.3	09/12/12:213356VRG	CCV	ug/L	200.0	95.8 %	70-130	
			CCV	ug/L	200.0	94.3 %	70-130	
Bentazon	515.3	09/11/12:210091VRG	Blank	ug/L		ND	<2	
			LCS	ug/L	8.000	107 %	70-130	
			MS	ug/L	8.000	103 %	70-130	
		(VI 1242142-001)	MSD	ug/L	8.000	110 %	70-130	
			MSRPD	ug/L	20.00	0.51	≤2	
	515.3	09/12/12:213680VRG	CCV	ug/L	20.00	417 %	70-130	360
			CCV	ug/L	20.00	379 %	70-130	360
Dalapon	515.3	09/11/12:210091VRG	Blank	ug/L		ND	<10	
	515.3	09/12/12:213680VRG	CCV	ug/L	130.0	220 %	70-130	360
			CCV	ug/L	130.0	352 %	70-130	360
Dicamba	515.3	09/11/12:210091VRG	Blank	ug/L		ND	<1	
			LCS	ug/L	4.000	108 %	70-130	
			MS	ug/L	4.000	98.5 %	70-130	
		(VI 1242142-001)	MSD	ug/L	4.000	96.3 %	70-130	
			MSRPD	ug/L	20.00	0.086	≤1	
	515.3	09/12/12:213680VRG	CCV	ug/L	10.00	359 %	70-130	360
			CCV	ug/L	10.00	389 %	70-130	360
Dinoseb	515.3	09/11/12:210091VRG	Blank	ug/L		ND	<1	
			LCS	ug/L	8.000	109 %	70-130	
			MS	ug/L	8.000	77.0 %	70-130	
		(VI 1242142-001)	MSD	ug/L	8.000	82.1 %	70-130	
			MSRPD	ug/L	20.00	6.4%	≤30.0	
	515.3	09/12/12:213680VRG	CCV	ug/L	20.00	357 %	70-130	360
			CCV	ug/L	20.00	371 %	70-130	360
Pentachlorophenol	515.3	09/11/12:210091VRG	Blank	ug/L		ND	<0.2	
			LCS	ug/L	4.000	108 %	70-130	
			MS	ug/L	4.000	96.1 %	70-130	
		(VI 1242142-001)	MSD	ug/L	4.000	94.6 %	70-130	
			MSRPD	ug/L	20.00	1.7%	≤30.0	
	515.3	09/12/12:213680VRG	CCV	ug/L	10.00	359 %	70-130	360
			CCV	ug/L	10.00	380 %	70-130	360
Picloram	515.3	09/11/12:210091VRG	Blank	ug/L		ND	<1	
	515.3	09/12/12:213680VRG	CCV	ug/L	10.00	117 %	70-130	
			CCV	ug/L	10.00	116 %	70-130	
1,1,1,2-Tetrachloroethane	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	111 %	71-125	
		(SP 1208765-001)	MSD	ug/L	10.00	117 %	71-125	
			MSRPD	ug/L	10.00	5.1%	≤15.6	

October 8, 2012 Lab ID : SP 1208765
Thomas Harder & Co. Customer : 2-24140

Quality Control - Organic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Organic								
1,1,1,2-Tetrachloroethane	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	93.8 %	70-130	
1,1,1-Trichloroethane(TCA)	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	122 %	44-165	
		(SP 1208765-001)	MSD	ug/L	10.00	126 %	44-165	
			MSRPD	ug/L	10.00	3.7%	≤16.4	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	80.9 %	70-130	
1,1,2,2-Tetrachloroethane	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	105 %	65-145	
		(SP 1208765-001)	MSD	ug/L	10.00	111 %	65-145	
			MSRPD	ug/L	10.00	5.1%	≤27.4	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	96.2 %	70-130	
1,1,2-Trichloroethane	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	98.7 %	61-136	
		(SP 1208765-001)	MSD	ug/L	10.00	106 %	61-136	
			MSRPD	ug/L	10.00	7.5%	≤24.5	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	89.9 %	70-130	
1,1-Dichloroethane	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	110 %	52-162	
		(SP 1208765-001)	MSD	ug/L	10.00	113 %	52-162	
			MSRPD	ug/L	10.00	2.2%	≤15.4	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	85.2 %	70-130	
1,1-Dichloroethylene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	117 %	52-175	
		(SP 1208765-001)	MSD	ug/L	10.00	120 %	52-175	
			MSRPD	ug/L	10.00	2.2%	≤18.1	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	76.2 %	70-130	
1,1-Dichloropropene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	119 %	62-137	
		(SP 1208765-001)	MSD	ug/L	10.00	123 %	62-137	
			MSRPD	ug/L	10.00	3.5%	≤14.5	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	77.9 %	70-130	
1,2,3-Trichlorobenzene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	124 %	58-187	
		(SP 1208765-001)	MSD	ug/L	10.00	130 %	58-187	
			MSRPD	ug/L	10.00	4.1%	≤22.6	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	110 %	70-130	
1,2,4-Trichlorobenzene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	124 %	59-164	
		(SP 1208765-001)	MSD	ug/L	10.00	130 %	59-164	
			MSRPD	ug/L	10.00	4.1%	≤21.3	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	110 %	70-130	
1,2,4-Trimethylbenzene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	116 %	73-129	
		(SP 1208765-001)	MSD	ug/L	10.00	120 %	73-129	
			MSRPD	ug/L	10.00	3.0%	≤17.6	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	86.6 %	70-130	
1,2-Dichlorobenzene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	111 %	71-137	
		(SP 1208765-001)	MSD	ug/L	10.00	116 %	71-137	
			MSRPD	ug/L	10.00	4.8%	≤17.3	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	93.0 %	70-130	
1,2-Dichlorobenzene-d4	524.2	08/30/12:209697VRG	Blank	ug/L	10.00	85.8 %	70-130	
			MS	ug/L	10.00	106 %	70-130	
		(SP 1208765-001)	MSD	ug/L	10.00	107 %	70-130	

October 8, 2012 Lab ID : SP 1208765
Thomas Harder & Co. Customer : 2-24140

Quality Control - Organic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Organic								
1,2-Dichlorobenzene-d4	524.2	08/30/12:209697VRG	MSRPD	ug/L	10.00	0.6%	≤30	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	106 %	70-130	
1,2-Dichloroethane (EDC)	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	118 %	59-147	
		(SP 1208765-001)	MSD	ug/L	10.00	125 %	59-147	
			MSRPD	ug/L	10.00	5.5%	≤14.3	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	107 %	70-130	
1,2-Dichloropropane	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	105 %	57-143	
		(SP 1208765-001)	MSD	ug/L	10.00	111 %	57-143	
			MSRPD	ug/L	10.00	5.6%	≤13.5	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	88.8 %	70-130	
1,3,5-Trimethylbenzene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	102 %	75-129	
		(SP 1208765-001)	MSD	ug/L	10.00	108 %	75-129	
			MSRPD	ug/L	10.00	5.8%	≤16.6	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	71.3 %	70-130	
1,3-Dichlorobenzene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	110 %	72-132	
		(SP 1208765-001)	MSD	ug/L	10.00	116 %	72-132	
			MSRPD	ug/L	10.00	5.0%	≤16.0	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	91.8 %	70-130	
1,3-Dichloropropane	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	99.2 %	64-128	
		(SP 1208765-001)	MSD	ug/L	10.00	108 %	64-128	
			MSRPD	ug/L	10.00	9.0%	≤26.9	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	89.9 %	70-130	
1,4-Dichlorobenzene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	111 %	72-134	
		(SP 1208765-001)	MSD	ug/L	10.00	116 %	72-134	
			MSRPD	ug/L	10.00	4.8%	≤17.9	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	93.0 %	70-130	
2,2-Dichloropropane	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	130 %	54-187	
		(SP 1208765-001)	MSD	ug/L	10.00	133 %	54-187	
			MSRPD	ug/L	10.00	2.8%	≤16.4	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	87.2 %	70-130	
2-Chlorotoluene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	112 %	75-126	
		(SP 1208765-001)	MSD	ug/L	10.00	117 %	75-126	
			MSRPD	ug/L	10.00	4.3%	≤16.3	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	86.6 %	70-130	
4-Bromofluorobenzene	524.2	08/30/12:209697VRG	Blank	ug/L	10.00	96.5 %	70-130	
			MS	ug/L	10.00	99.9 %	70-130	
		(SP 1208765-001)	MSD	ug/L	10.00	102 %	70-130	
			MSRPD	ug/L	10.00	2.5%	≤30	
4-Bromofluorobenzene (BFB)	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	99.2 %	70-130	
4-Chlorotoluene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	106 %	74-127	
		(SP 1208765-001)	MSD	ug/L	10.00	114 %	74-127	
			MSRPD	ug/L	10.00	7.0%	≤17.8	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	84.5 %	70-130	
Benzene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	110 %	67-128	

October 8, 2012 Lab ID : SP 1208765
Thomas Harder & Co. Customer : 2-24140

Quality Control - Organic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Organic								
Benzene	524.2	(SP 1208765-001)	MSD	ug/L	10.00	114 %	67-128	
			MSRPD	ug/L	10.00	3.8%	≤14.3	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	84.0 %	70-130	
Bromobenzene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	108 %	67-131	
		(SP 1208765-001)	MSD	ug/L	10.00	116 %	67-131	
			MSRPD	ug/L	10.00	7.1%	≤17.1	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	92.3 %	70-130	
Bromochloromethane	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	110 %	57-152	
		(SP 1208765-001)	MSD	ug/L	10.00	115 %	57-152	
			MSRPD	ug/L	10.00	4.0%	≤19.6	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	98.2 %	70-130	
Bromodichloromethane	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	103 %	63-134	
		(SP 1208765-001)	MSD	ug/L	10.00	108 %	63-134	
			MSRPD	ug/L	10.00	4.9%	≤15.6	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	89.4 %	70-130	
Bromoform	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	89.8 %	55-147	
		(SP 1208765-001)	MSD	ug/L	10.00	96.2 %	55-147	
			MSRPD	ug/L	10.00	6.9%	≤18.7	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	88.2 %	70-130	
Bromomethane (Methyl Bromide)	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	83.9 %	46-199	
		(SP 1208765-001)	MSD	ug/L	10.00	94.2 %	46-199	
			MSRPD	ug/L	10.00	11.5%	≤17.9	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	79.8 %	70-130	
Carbon Tetrachloride	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	122 %	51-160	
		(SP 1208765-001)	MSD	ug/L	10.00	127 %	51-160	
			MSRPD	ug/L	10.00	4.1%	≤15.0	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	77.8 %	70-130	
Chlorobenzene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	106 %	68-121	
		(SP 1208765-001)	MSD	ug/L	10.00	114 %	68-121	
			MSRPD	ug/L	10.00	7.3%	≤16.1	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	85.7 %	70-130	
Chloroethane (Ethyl Chloride)	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	95.7 %	41-175	
		(SP 1208765-001)	MSD	ug/L	10.00	116 %	41-175	
			MSRPD	ug/L	10.00	19.0%	≤18.0	435
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	76.7 %	70-130	
Chloroform	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	110 %	57-155	
		(SP 1208765-001)	MSD	ug/L	10.00	113 %	57-155	
			MSRPD	ug/L	10.00	2.9%	≤18.2	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	89.7 %	70-130	
Chloromethane(Methyl Chloride)	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	115 %	5-241	
		(SP 1208765-001)	MSD	ug/L	10.00	128 %	5-241	
			MSRPD	ug/L	10.00	10.0%	≤23.3	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	95.4 %	70-130	
cis-1,2-Dichloroethylene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	

October 8, 2012 Lab ID : SP 1208765
Thomas Harder & Co. Customer : 2-24140

Quality Control - Organic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Organic								
cis-1,2-Dichloroethylene	524.2		MS	ug/L	10.00	115 %	59-159	
		(SP 1208765-001)	MSD	ug/L	10.00	118 %	59-159	
			MSRPD	ug/L	10.00	3.2%	≤16.1	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	93.4 %	70-130	
cis-1,3-Dichloropropene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	123 %	63-129	
		(SP 1208765-001)	MSD	ug/L	10.00	131 %	63-129	435
			MSRPD	ug/L	10.00	6.6%	≤20.7	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	99.8 %	70-130	
Dibromochloromethane	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	94.5 %	66-128	
		(SP 1208765-001)	MSD	ug/L	10.00	101 %	66-128	
			MSRPD	ug/L	10.00	7.1%	≤22.0	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	88.2 %	70-130	
Dibromomethane	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	103 %	63-141	
		(SP 1208765-001)	MSD	ug/L	10.00	109 %	63-141	
			MSRPD	ug/L	10.00	5.0%	≤17.2	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	94.5 %	70-130	
Dichlorodifluoromethane	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	144 %	42-168	
		(SP 1208765-001)	MSD	ug/L	10.00	155 %	42-168	
			MSRPD	ug/L	10.00	7.0%	≤43.4	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	92.4 %	70-130	
Dichloromethane	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	120 %	40-158	
		(SP 1208765-001)	MSD	ug/L	10.00	123 %	40-158	
			MSRPD	ug/L	10.00	2.5%	≤13.8	
Ethyl tert-Butyl Ether	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<3	
			MS	ug/L	10.00	118 %	50-157	
		(SP 1208765-001)	MSD	ug/L	10.00	122 %	50-157	
			MSRPD	ug/L	10.00	0.39	≤3	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	106 %	70-130	
Ethylbenzene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	112 %	74-119	
		(SP 1208765-001)	MSD	ug/L	10.00	119 %	74-119	
			MSRPD	ug/L	10.00	6.3%	≤15.7	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	81.3 %	70-130	
Freon-11	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	109 %	34-129	
		(SP 1208765-001)	MSD	ug/L	10.00	115 %	34-129	
			MSRPD	ug/L	10.00	4.9%	≤19.5	
Hexachlorobutadiene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	139 %	42-194	
		(SP 1208765-001)	MSD	ug/L	10.00	141 %	42-194	
			MSRPD	ug/L	10.00	1.5%	≤20.2	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	94.3 %	70-130	
Isopropyl Ether	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<3	
			MS	ug/L	10.00	117 %	21-191	
		(SP 1208765-001)	MSD	ug/L	10.00	121 %	21-191	
			MSRPD	ug/L	10.00	0.37	≤3	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	102 %	70-130	
Isopropylbenzene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	102 %	72-125	

October 8, 2012 Lab ID : SP 1208765
Thomas Harder & Co. Customer : 2-24140

Quality Control - Organic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Organic								
Isopropylbenzene	524.2	(SP 1208765-001)	MSD	ug/L	10.00	108 %	72-125	
			MSRPD	ug/L	10.00	5.8%	≤16.2	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	71.4 %	70-130	
Methyl tert-Butyl Ether	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	109 %	70-130	
Methyl tert-Butyl Ether (MTBE)	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<1.0	
			MS	ug/L	10.00	117 %	55-167	
		(SP 1208765-001)	MSD	ug/L	10.00	121 %	55-167	
			MSRPD	ug/L	10.00	3.6%	≤20.3	
Methylene Chloride	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	104 %	70-130	
Naphthalene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	119 %	70-171	
		(SP 1208765-001)	MSD	ug/L	10.00	122 %	70-171	
			MSRPD	ug/L	10.00	2.4%	≤39.5	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	115 %	70-130	
n-Butylbenzene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	118 %	77-141	
		(SP 1208765-001)	MSD	ug/L	10.00	124 %	77-141	
			MSRPD	ug/L	10.00	4.6%	≤17.8	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	81.6 %	70-130	
n-Propylbenzene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	121 %	74-131	
		(SP 1208765-001)	MSD	ug/L	10.00	128 %	74-131	
			MSRPD	ug/L	10.00	5.7%	≤16.9	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	83.7 %	70-130	
p-Isopropyltoluene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	117 %	73-133	
		(SP 1208765-001)	MSD	ug/L	10.00	121 %	73-133	
			MSRPD	ug/L	10.00	3.6%	≤19.4	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	82.6 %	70-130	
sec-Butylbenzene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	121 %	73-133	
		(SP 1208765-001)	MSD	ug/L	10.00	127 %	73-133	
			MSRPD	ug/L	10.00	4.9%	≤18.2	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	81.0 %	70-130	
Styrene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	96.5 %	73-125	
		(SP 1208765-001)	MSD	ug/L	10.00	95.0 %	73-125	
			MSRPD	ug/L	10.00	1.7%	≤15.5	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	85.4 %	70-130	
TAME	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<3	
			MS	ug/L	10.00	114 %	64-124	
		(SP 1208765-001)	MSD	ug/L	10.00	118 %	64-124	
			MSRPD	ug/L	10.00	0.40	≤3	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	105 %	70-130	
tert-Butylbenzene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	117 %	70-128	
		(SP 1208765-001)	MSD	ug/L	10.00	121 %	70-128	
			MSRPD	ug/L	10.00	3.7%	≤18.7	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	82.8 %	30-130	
Tetrachloroethylene (PCE)	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	119 %	56-128	
		(SP 1208765-001)	MSD	ug/L	10.00	126 %	56-128	
			MSRPD	ug/L	10.00	6.1%	≤29.0	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	79.9 %	70-130	

October 8, 2012 Lab ID : SP 1208765
Thomas Harder & Co. Customer : 2-24140

Quality Control - Organic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Organic								
Toluene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	108 %	67-124	
		(SP 1208765-001)	MSD	ug/L	10.00	115 %	67-124	
			MSRPD	ug/L	10.00	5.8%	≤16.1	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	81.8 %	30-130	
trans-1,2-Dichloroethylene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	115 %	46-158	
		(SP 1208765-001)	MSD	ug/L	10.00	117 %	46-158	
			MSRPD	ug/L	10.00	1.7%	≤16.9	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	83.7 %	70-130	
trans-1,3-Dichloropropene	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	103 %	63-129	
		(SP 1208765-001)	MSD	ug/L	10.00	110 %	63-129	
			MSRPD	ug/L	10.00	7.2%	≤25.8	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	88.4 %	70-130	
Trichloroethylene (TCE)	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	113 %	70-123	
		(SP 1208765-001)	MSD	ug/L	10.00	119 %	70-123	
			MSRPD	ug/L	10.00	4.7%	≤16.8	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	85.0 %	70-130	
Trichlorofluoromethane F-11	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	71.4 %	70-130	
Trichlorotrifluoroethane F-113	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	125 %	5-273	
		(SP 1208765-001)	MSD	ug/L	10.00	130 %	5-273	
			MSRPD	ug/L	10.00	3.6%	≤16.9	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	73.6 %	70-130	
Vinyl Chloride	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	102 %	33-199	
		(SP 1208765-001)	MSD	ug/L	10.00	123 %	33-199	
			MSRPD	ug/L	10.00	19.2%	≤18.6	435
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	70.5 %	30-130	
Xylenes m,p	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	20.00	109 %	73-119	
		(SP 1208765-001)	MSD	ug/L	20.00	115 %	73-119	
			MSRPD	ug/L	10.00	5.6%	≤16.1	
	524.2	08/31/12:212822VRG	CCV	ug/L	20.00	80.8 %	70-130	
Xylenes o	524.2	08/30/12:209697VRG	Blank	ug/L		ND	<0.5	
			MS	ug/L	10.00	109 %	72-124	
		(SP 1208765-001)	MSD	ug/L	10.00	115 %	72-124	
			MSRPD	ug/L	10.00	4.7%	≤17.5	
	524.2	08/31/12:212822VRG	CCV	ug/L	10.00	85.8 %	70-130	
3-Hydroxycarbofuran	531.1	09/12/12:210149SG	Blank	ug/L		ND	<3	
			LCS	ug/L	20.00	97.0 %	80-120	
			MS	ug/L	20.00	98.6 %	65-135	
		(SP 1209056-001)	MSD	ug/L	20.00	94.6 %	65-135	
			MSRPD	ug/L	20.00	4.2%	≤16.8	
	531.1	09/12/12:213421SG	CCV	ug/L	10.00	92.3 %	80-120	
			CCV	ug/L	20.00	95.1 %	80-120	
Aldicarb	531.1	09/12/12:210149SG	Blank	ug/L		ND	<3	
			LCS	ug/L	20.00	100 %	80-120	
			MS	ug/L	20.00	91.8 %	65-135	
		(SP 1209056-001)	MSD	ug/L	20.00	89.9 %	65-135	
			MSRPD	ug/L	20.00	2.0%	≤11.2	
	531.1	09/12/12:213421SG	CCV	ug/L	10.00	95.1 %	80-120	

October 8, 2012 Lab ID : SP 1208765
Thomas Harder & Co. Customer : 2-24140

Quality Control - Organic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Organic								
Aldicarb	531.1	09/13/12:213421SG	CCV	ug/L	20.00	98.2 %	80-120	
Aldicarb Sulfone	531.1	09/12/12:213421SG	CCV	ug/L	10.00	97.5 %	80-120	
			CCV	ug/L	20.00	89.8 %	80-120	
Aldicarb Sulfone/Sulfoxide	531.1	09/12/12:210149SG	Blank	ug/L		ND	<2	
			Blank	ug/L		ND	<3	
			LCS	ug/L	20.00	95.6 %	80-120	
			LCS	ug/L	20.00	93.7 %	80-120	
			MS	ug/L	20.00	86.9 %	65-135	
			MS	ug/L	20.00	92.1 %	65-135	
		(SP 1209056-001)	MSD	ug/L	20.00	89.0 %	65-135	
		(SP 1209056-001)	MSD	ug/L	20.00	93.0 %	65-135	
			MSRPD	ug/L	20.00	1.0%	≤7.28	
			MSRPD	ug/L	20.00	2.3%	≤13.8	
Aldicarb Sulfoxide	531.1	09/12/12:213421SG	CCV	ug/L	10.00	90.3 %	80-120	
			CCV	ug/L	20.00	90.5 %	80-120	
Carbaryl	531.1	09/12/12:213421SG	CCV	ug/L	10.00	90.3 %	80-120	
			CCV	ug/L	20.00	94.0 %	80-120	
Carbaryl/Naphthol	531.1	09/12/12:210149SG	Blank	ug/L		ND	<5	
			LCS	ug/L	20.00	97.7 %	80-120	
			MS	ug/L	20.00	89.1 %	65-135	
		(SP 1209056-001)	MSD	ug/L	20.00	87.9 %	65-135	
			MSRPD	ug/L	20.00	0.24	≤5	
Carbofuran	531.1	09/12/12:210149SG	Blank	ug/L		ND	<5	
			LCS	ug/L	20.00	100 %	80-120	
			MS	ug/L	20.00	95.4 %	65-135	
		(SP 1209056-001)	MSD	ug/L	20.00	91.0 %	65-135	
			MSRPD	ug/L	20.00	0.88	≤5	
	531.1	09/12/12:213421SG	CCV	ug/L	10.00	98.6 %	80-120	
			CCV	ug/L	20.00	97.0 %	80-120	
Methomyl	531.1	09/12/12:210149SG	Blank	ug/L		ND	<2	
			LCS	ug/L	20.00	97.2 %	80-120	
			MS	ug/L	20.00	92.2 %	65-135	
		(SP 1209056-001)	MSD	ug/L	20.00	91.2 %	65-135	
			MSRPD	ug/L	20.00	1.1%	≤53.1	
	531.1	09/12/12:213421SG	CCV	ug/L	10.00	88.1 %	80-120	
			CCV	ug/L	20.00	91.0 %	80-120	
Oxamyl	531.1	09/12/12:210149SG	Blank	ug/L		ND	<5	
			LCS	ug/L	20.00	97.9 %	80-120	
			MS	ug/L	20.00	93.4 %	65-135	
		(SP 1209056-001)	MSD	ug/L	20.00	93.6 %	65-135	
			MSRPD	ug/L	20.00	0.040	≤5	
	531.1	09/12/12:213421SG	CCV	ug/L	10.00	86.9 %	80-120	
			CCV	ug/L	20.00	91.3 %	80-120	
Glyphosate	547	09/06/12:209907SG	Blank	ug/L		ND	<20	
			LCS	ug/L	198.5	98.2 %	76-119	
			MS	ug/L	198.5	99.3 %	56-139	
		(VI 1242091-001)	MSD	ug/L	198.5	94.8 %	56-139	
			MSRPD	ug/L	198.5	4.6%	≤14.5	
	547	09/06/12:213097SG	CCV	ug/L	100.0	95.4 %	80-120	
			CCV	ug/L	200.0	89.6 %	80-120	
Endothall	548.1	09/05/12:209840SG	Blank	ug/L		ND	<40	
			LCS	ug/L	166.7	65.6 %	7-141	
			MS	ug/L	83.33	52.1 %	7-137	
		(SP 1208765-001)	MSD	ug/L	83.33	60.1 %	7-137	

October 8, 2012 Lab ID : SP 1208765

Thomas Harder & Co. Customer : 2-24140

Quality Control - Organic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Organic								
Endothall	548.1	09/05/12:209840SG	MSRPD	ug/L	83.33	6.7	≤40	
	548.1	09/12/12:213471SG	CCV	ug/L	1000	114 %	70-130	
			CCV	ug/L	2500	97.6 %	70-130	
Diquat Dibromide	549	09/04/12:209775SG	Blank	ug/L		ND	<2	
			LCS	ug/L	20.00	44.5 %	19-113	
			MS	ug/L	20.00	11.7 %	10-125	
		(VI 1242091-001)	MSD	ug/L	20.00	3.5 %	10-125	435
			MSRPD	ug/L	20.00	1.6	≤2	
	549.2	09/11/12:213332SG	CCV	ug/L	1000	94.4 %	80-120	
			CCV	ug/L	500.0	99.4 %	80-120	

Definition

CCV	: Continuing Calibration Verification - Analyzed to verify the instrument calibration is within criteria.
Blank	: Method Blank - Prepared to verify that the preparation process is not contributing contamination to the samples.
LCS	: Laboratory Control Standard/Sample - Prepared to verify that the preparation process is not affecting analyte recovery.
MS	: Matrix Spikes - A random sample is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.
MSD	: Matrix Spike Duplicate of MS/MSD pair - A random sample duplicate is spiked with a known amount of analyted. The recoveries are an indication of how that sample matrix affects analyte recovery.
MSRPD	: MS/MSD Relative Percent Difference (RPD) - The MS relative percent difference is an indication of precision for the preparation and analysis.
ND	: Non-detect - Result was below the DQO listed for the analyte.
DQO	: Data Quality Objective - This is the criteria against which the quality control data is compared.

Explanation

360	: CCV above Acceptance Range (AR). Samples which were non detect for this analyte were accepted.
435	: Sample matrix may be affecting this analyte. Data was accepted based on the LCS or CCV recovery.

October 8, 2012 Lab ID : SP 1208765
Thomas Harder & Co. Customer : 2-24140

Quality Control - Inorganic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Metals								
Boron	200.7		MS	mg/L	4.000	92.9 %	75-125	
		(SP 1208768-008)	MSD	mg/L	4.000	93.3 %	75-125	
			MSRPD	mg/L	798.8	0.4%	≤20.0	
	200.7	08/30/12:212887AC	CCV	ppm	5.000	101 %	90-110	
			CCB	ppm		0.066	0.10	
			CCV	ppm	5.000	101 %	90-110	
			CCB	ppm		0.086	0.10	
Calcium	200.7		MS	mg/L	12.00	79.9 %	75-125	
		(SP 1208768-008)	MSD	mg/L	12.00	78.7 %	75-125	
			MSRPD	mg/L	798.8	0.1%	≤20.0	
	200.7	08/30/12:212887AC	CCV	ppm	25.00	98.5 %	90-110	
			CCB	ppm		0.009	1.0	
			CCV	ppm	25.00	97.8 %	90-110	
			CCB	ppm		0.02	1.0	
Copper	200.7		MS	ug/L	800.0	100 %	75-125	
		(SP 1208768-008)	MSD	ug/L	800.0	99.0 %	75-125	
			MSRPD	ug/L	798.8	1.1%	≤20.0	
	200.7	08/30/12:212887AC	CCV	ppm	1.000	102 %	90-110	
			CCB	ppm		-0.0007	0.01	
			CCV	ppm	1.000	101 %	90-110	
			CCB	ppm		-0.0013	0.01	
Iron	200.7		MS	ug/L	3992	98.1 %	75-125	
		(SP 1208768-008)	MSD	ug/L	3992	96.5 %	75-125	
			MSRPD	ug/L	798.8	1.6%	≤20.0	
	200.7	08/30/12:212887AC	CCV	ppm	5.000	101 %	90-110	
			CCB	ppm		0.0006	0.05	
			CCV	ppm	5.000	100 %	90-110	
			CCB	ppm		0.0005	0.05	
Magnesium	200.7		MS	mg/L	12.00	86.0 %	75-125	
		(SP 1208768-008)	MSD	mg/L	12.00	83.8 %	75-125	
			MSRPD	mg/L	798.8	0.3%	≤20.0	
	200.7	08/30/12:212887AC	CCV	ppm	25.00	102 %	90-110	
			CCB	ppm		0.006	1.0	
			CCV	ppm	25.00	102 %	90-110	
			CCB	ppm		0.002	1.0	
Manganese	200.7		MS	ug/L	800.0	99.2 %	75-125	
		(SP 1208768-008)	MSD	ug/L	800.0	97.0 %	75-125	
			MSRPD	ug/L	798.8	2.2%	≤20.0	
	200.7	08/30/12:212887AC	CCV	ppm	1.000	99.8 %	90-110	
			CCB	ppm		0.00009	0.01	
			CCV	ppm	1.000	99.4 %	90-110	
			CCB	ppm		0.00002	0.01	
Potassium	200.7		MS	mg/L	12.00	108 %	75-125	
		(SP 1208768-008)	MSD	mg/L	12.00	106 %	75-125	
			MSRPD	mg/L	798.8	1.9%	≤20.0	
	200.7	08/30/12:212887AC	CCV	ppm	25.00	101 %	90-110	
			CCB	ppm		0.002	1.0	
			CCV	ppm	25.00	100 %	90-110	
			CCB	ppm		-0.03	1.0	
Silicon	200.7	08/30/12:212887AC	CCV	ppm	5.000	102 %	90-110	
			CCB	ppm		0.003	1.0	
			CCV	ppm	5.000	101 %	90-110	
			CCB	ppm		-0.001	1.0	
Sodium	200.7		MS	mg/L	12.00	95.1 %	75-125	
		(SP 1208768-008)	MSD	mg/L	12.00	91.1 %	75-125	

October 8, 2012 Lab ID : SP 1208765
Thomas Harder & Co. Customer : 2-24140

Quality Control - Inorganic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Metals								
Sodium	200.7	08/30/12:209644AC	MSRPD	mg/L	798.8	0.4%	≤20.0	
	200.7	08/30/12:212887AC	CCV	ppm	25.00	99.5 %	90-110	
			CCB	ppm		-0.009	1.0	
			CCV	ppm	25.00	99.2 %	90-110	
			CCB	ppm		0.04	1.0	
Zinc	200.7		MS	ug/L	800.0	94.2 %	75-125	
		(SP 1208768-008)	MSD	ug/L	800.0	92.0 %	75-125	
			MSRPD	ug/L	798.8	2.4%	≤20.0	
	200.7	08/30/12:212887AC	CCV	ppm	1.000	97.0 %	90-110	
			CCB	ppm		0.0004	0.02	
			CCV	ppm	1.000	95.7 %	90-110	
			CCB	ppm		0.0019	0.02	
Aluminum	200.8		MS	ug/L	29.98	94.6 %	75-125	
		(SP 1208634-001)	MSD	ug/L	29.98	92.6 %	75-125	
			MSRPD	ug/L	9.992	0.59	≤10	
			MS	ug/L	29.98	92.3 %	75-125	
		(SP 1208640-003)	MSD	ug/L	29.98	91.6 %	75-125	
			MSRPD	ug/L	9.992	0.19	≤10	
	200.8	09/01/12:212888AC	CCV	ppb	120.0	98.2 %	90-110	
			CCB	ppb		0.4	10	
			CCV	ppb	120.0	97.6 %	90-110	
			CCB	ppb		0.5	10	
			CCV	ppb	120.0	95.1 %	90-110	
			CCB	ppb		-0.3	10	
			CCV	ppb	120.0	95.4 %	90-110	
			CCB	ppb		0.7	10	
Antimony	200.8		MS	ug/L	8.000	42.0 %	75-125	435
		(SP 1208634-001)	MSD	ug/L	8.000	37.1 %	75-125	435
			MSRPD	ug/L	9.992	0.39	≤1	
			MS	ug/L	8.000	46.1 %	75-125	435
		(SP 1208640-003)	MSD	ug/L	8.000	40.9 %	75-125	435
			MSRPD	ug/L	9.992	0.42	≤1	
	200.8	09/07/12:213175AC	CCV	ppb	120.0	94.0 %	90-110	
			CCB	ppb		0.48	1	
			CCV	ppb	120.0	94.9 %	90-110	
			CCB	ppb		1.58	1	
Arsenic	200.8		MS	ug/L	10.00	58.2 %	75-125	435
		(SP 1208634-001)	MSD	ug/L	10.00	58.9 %	75-125	435
			MSRPD	ug/L	9.992	0.068	≤2	
			MS	ug/L	10.00	56.2 %	75-125	435
		(SP 1208640-003)	MSD	ug/L	10.00	63.2 %	75-125	435
			MSRPD	ug/L	9.992	0.70	≤2	
	200.8	09/01/12:212888AC	CCV	ppb	120.0	92.3 %	90-110	
			CCB	ppb		0.11	2	
			CCV	ppb	120.0	94.1 %	90-110	
			CCB	ppb		0.07	2	
			CCV	ppb	120.0	94.6 %	90-110	
			CCB	ppb		0.03	2	
			CCV	ppb	120.0	92.4 %	90-110	
			CCB	ppb		0.11	2	
Barium	200.8		MS	ug/L	9.990	58.2 %	75-125	435
		(SP 1208634-001)	MSD	ug/L	9.990	55.6 %	75-125	435
			MSRPD	ug/L	9.992	1.0%	≤20	
			MS	ug/L	9.990	66.0 %	75-125	435

October 8, 2012 Lab ID : SP 1208765
Thomas Harder & Co. Customer : 2-24140

Quality Control - Inorganic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Metals								
Barium	200.8	(SP 1208640-003)	MSD	ug/L	9.990	68.1 %	75-125	435
			MSRPD	ug/L	9.992	0.5%	≤20	
	200.8	09/07/12:213175AC	CCV	ppb	120.0	97.0 %	90-110	
			CCB	ppb		0.04	1	
			CCV	ppb	120.0	98.8 %	90-110	
			CCB	ppb		0.01	1	
Beryllium	200.8		MS	ug/L	10.02	59.1 %	75-125	435
		(SP 1208634-001)	MSD	ug/L	10.02	58.1 %	75-125	435
			MSRPD	ug/L	9.992	1.7%	≤20	
			MS	ug/L	10.02	55.9 %	75-125	435
		(SP 1208640-003)	MSD	ug/L	10.02	59.5 %	75-125	435
			MSRPD	ug/L	9.992	6.2%	≤20	
	200.8	09/01/12:212888AC	CCV	ppb	120.0	93.1 %	90-110	
			CCB	ppb		0.066	0.2	
			CCV	ppb	120.0	96.9 %	90-110	
			CCB	ppb		0.042	0.2	
			CCV	ppb	120.0	95.8 %	90-110	
			CCB	ppb		0.036	0.2	
			CCV	ppb	120.0	97.2 %	90-110	
			CCB	ppb		0.107	0.2	
Cadmium	200.8		MS	ug/L	10.00	60.4 %	75-125	435
		(SP 1208634-001)	MSD	ug/L	10.00	62.3 %	75-125	435
			MSRPD	ug/L	9.992	3.1%	≤20	
			MS	ug/L	10.00	68.3 %	75-125	435
		(SP 1208640-003)	MSD	ug/L	10.00	59.8 %	75-125	435
			MSRPD	ug/L	9.992	13.1%	≤20	
	200.8	09/01/12:212888AC	CCV	ppb	120.0	92.2 %	90-110	
			CCB	ppb		0.054	0.2	
			CCV	ppb	120.0	93.6 %	90-110	
			CCB	ppb		0.022	0.2	
			CCV	ppb	120.0	95.0 %	90-110	
			CCB	ppb		0.028	0.2	
			CCV	ppb	120.0	93.8 %	90-110	
			CCB	ppb		0.087	0.2	
Chromium	200.8		MS	ug/L	10.00	55.2 %	75-125	435
		(SP 1208634-001)	MSD	ug/L	10.00	56.5 %	75-125	435
			MSRPD	ug/L	9.992	2.3%	≤20	
			MS	ug/L	10.00	53.8 %	75-125	435
		(SP 1208640-003)	MSD	ug/L	10.00	54.9 %	75-125	435
			MSRPD	ug/L	9.992	1.9%	≤20	
	200.8	09/01/12:212888AC	CCV	ppb	120.0	95.8 %	90-110	
			CCB	ppb		0.04	1	
			CCV	ppb	120.0	96.4 %	90-110	
			CCB	ppb		0.04	1	
			CCV	ppb	120.0	97.2 %	90-110	
			CCB	ppb		0.04	1	
			CCV	ppb	120.0	96.7 %	90-110	
			CCB	ppb		0.08	1	
Lead	200.8		MS	ug/L	10.00	58.9 %	75-125	435
		(SP 1208634-001)	MSD	ug/L	10.00	59.2 %	75-125	435
			MSRPD	ug/L	9.992	0.4%	≤20	
			MS	ug/L	10.00	67.2 %	75-125	435
		(SP 1208640-003)	MSD	ug/L	10.00	61.0 %	75-125	435
			MSRPD	ug/L	9.992	9.4%	≤20	

October 8, 2012 Lab ID : SP 1208765
Thomas Harder & Co. Customer : 2-24140

Quality Control - Inorganic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Metals								
Lead	200.8	09/01/12:212888AC	CCV	ppb	120.0	95.8 %	90-110	
			CCB	ppb		0.106	0.2	
			CCV	ppb	120.0	96.1 %	90-110	
			CCB	ppb		0.039	0.2	
			CCV	ppb	120.0	96.3 %	90-110	
			CCB	ppb		0.016	0.2	
			CCV	ppb	120.0	96.3 %	90-110	
			CCB	ppb		0.111	0.2	
Nickel	200.8		MS	ug/L	10.00	57.4 %	75-125	435
		(SP 1208634-001)	MSD	ug/L	10.00	57.2 %	75-125	435
			MSRPD	ug/L	9.992	0.2%	≤20	
			MS	ug/L	10.00	55.2 %	75-125	435
		(SP 1208640-003)	MSD	ug/L	10.00	53.9 %	75-125	435
			MSRPD	ug/L	9.992	0.12	≤1	
	200.8	09/01/12:212888AC	CCV	ppb	120.0	96.5 %	90-110	
			CCB	ppb		0.05	1	
			CCV	ppb	120.0	98.6 %	90-110	
			CCB	ppb		0.03	1	
			CCV	ppb	120.0	99.3 %	90-110	
			CCB	ppb		0.02	1	
			CCV	ppb	120.0	98.2 %	90-110	
			CCB	ppb		0.09	1	
Selenium	200.8		MS	ug/L	9.998	57.6 %	75-125	435
		(SP 1208634-001)	MSD	ug/L	9.998	57.4 %	75-125	435
			MSRPD	ug/L	9.992	0.014	≤2	
			MS	ug/L	9.998	61.4 %	75-125	435
		(SP 1208640-003)	MSD	ug/L	9.998	74.7 %	75-125	
			MSRPD	ug/L	9.992	6.7%	≤20	
	200.8	09/01/12:212888AC	CCV	ppb	120.0	90.8 %	90-110	
			CCB	ppb		0.09	2	
			CCV	ppb	120.0	91.2 %	90-110	
			CCB	ppb		-0.08	2	
			CCV	ppb	120.0	91.6 %	90-110	
			CCB	ppb		-0.13	2	
			CCV	ppb	120.0	90.3 %	90-110	
			CCB	ppb		-0.04	2	
Silver	200.8		MS	ug/L	9.992	47.2 %	75-125	435
		(SP 1208634-001)	MSD	ug/L	9.992	47.9 %	75-125	435
			MSRPD	ug/L	9.992	0.070	≤1	
			MS	ug/L	9.992	31.7 %	75-125	435
		(SP 1208640-003)	MSD	ug/L	9.992	45.7 %	75-125	435
			MSRPD	ug/L	9.992	1.4	≤1	435
	200.8	09/01/12:212888AC	CCV	ppb	120.0	97.0 %	90-110	
			CCB	ppb		0.02	1	
			CCV	ppb	120.0	97.8 %	90-110	
			CCB	ppb		0.03	1	
			CCV	ppb	120.0	98.2 %	90-110	
			CCB	ppb		0.03	1	
			CCV	ppb	120.0	97.8 %	90-110	
			CCB	ppb		0.08	1	
Thallium	200.8		MS	ug/L	9.998	58.6 %	75-125	435
		(SP 1208634-001)	MSD	ug/L	9.998	59.7 %	75-125	435
			MSRPD	ug/L	9.992	1.9%	≤20	
			MS	ug/L	9.998	67.8 %	75-125	435

October 8, 2012 Lab ID : SP 1208765
Thomas Harder & Co. Customer : 2-24140

Quality Control - Inorganic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Metals								
Thallium	200.8	(SP 1208640-003)	MSD	ug/L	9.998	62.3 %	75-125	435
			MSRPD	ug/L	9.992	8.4%	≤20	
	200.8	09/01/12:212888AC	CCV	ppb	120.0	95.0 %	90-110	
			CCB	ppb		0.058	0.2	
			CCV	ppb	120.0	95.0 %	90-110	
			CCB	ppb		0.036	0.2	
			CCV	ppb	120.0	96.1 %	90-110	
			CCB	ppb		0.032	0.2	
			CCV	ppb	120.0	95.4 %	90-110	
			CCB	ppb		0.112	0.2	
Vanadium	200.8		MS	ug/L	10.00	57.0 %	75-125	435
		(SP 1208634-001)	MSD	ug/L	10.00	58.8 %	75-125	435
			MSRPD	ug/L	9.992	0.18	≤2	
			MS	ug/L	10.00	55.4 %	75-125	435
		(SP 1208640-003)	MSD	ug/L	10.00	59.7 %	75-125	435
			MSRPD	ug/L	9.992	4.1%	≤20	
	200.8	09/01/12:212888AC	CCV	ppb	120.0	95.2 %	90-110	
			CCB	ppb		0.1	2	
			CCV	ppb	120.0	95.9 %	90-110	
			CCB	ppb		0.05	2	
			CCV	ppb	120.0	96.7 %	90-110	
			CCB	ppb		0.07	2	
			CCV	ppb	120.0	96.0 %	90-110	
			CCB	ppb		0.12	2	
Mercury	245.1	09/05/12:209849ac	Blank	ug/L		ND	<0.02	
			LCS	ug/L	0.2000	100 %	85-115	
			MS	ug/L	0.2000	94.8 %	75-125	
		(SP 1208634-001)	MSD	ug/L	0.2000	90.9 %	75-125	
			MSRPD	ug/L	0.2000	4.1%	≤20	
	245.1	09/06/12:213172AC	CCV	ppt	200.0	97.8 %	90-110	
			CCB	ppt		4.3	20	
			CCV	ppt	200.0	98.4 %	90-110	
			CCB	ppt		3.8	20	
Wet Chem								
Color	2120B	(SP 1208765-001)	Dup	units		0.0	5	
	2120B	08/30/12:212801jmg	CCB	units		0.00	5.0	
			CCV	units	10.00	100 %	90-110	
Turbidity	2130B	(SP 1208749-001)	Dup	NTU		0.0020	0.2	
	2130B	08/30/12:212918jam	CCB	NTU		0.087	0.2	
			CCV	NTU	2.000	102 %	90-110	
			CCB	NTU		0.099	0.2	
			CCV	NTU	2.000	100 %	90-110	
Odor	2150B	(SP 1208765-001)	Dup	TON		0.0	1	
Alkalinity (as CaCO3)	2320B	(CC 1282494-001)	Dup	mg/L		3.6%	3.42	440
	2320B	09/04/12:212980AMB	CCV	mg/L	234.9	98.4 %	90-110	
			CCV	mg/L	234.9	102 %	90-110	
Bicarbonate	2320B	(CC 1282494-001)	Dup	mg/L		3.5%	4.78	
Carbonate	2320B	(CC 1282494-001)	Dup	mg/L		0.0	10	
Hydroxide	2320B	(CC 1282494-001)	Dup	mg/L		0.0	10	
Conductivity	2510B	08/30/12:212774JMG	ICB	umhos/cm		0.09	1	
			CCV	umhos/cm	996.0	101 %	95-105	
			CCV	umhos/cm	996.0	101 %	95-105	
E. C.	2510B	08/30/12:209665jmg	Blank	umhos/cm		ND	<1	
		(CH 1275672-001)	Dup	umhos/cm		0.2%	10	

October 8, 2012 Lab ID : SP 1208765
Thomas Harder & Co. Customer : 2-24140

Quality Control - Inorganic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Wet Chem								
Solids, Total Dissolved	2540CE	08/31/12:209720CTL	Blank	mg/L		ND	<20	
			LCS	mg/L	995.0	101 %	90-110	
		(CH 1275853-001)	Dup	mg/L		0.8%	10.0	
Chloride	300.0	08/30/12:209694CHL	LCS	mg/L	25.00	98.5 %	90-110	
			MS	mg/L	500.0	101 %	86-128	
		(SP 1208765-001)	MSD	mg/L	500.0	99.8 %	86-128	
			MSRPD	mg/L	100.0	0.8%	≤23.0	
	300.0	08/30/12:212905CHL	ICV	ppm	50.00	98.1 %	90-110	
			ICB	ppm		-0.47	1	
			CCB	ppm		-0.49	1	
			CCV	ppm	25.00	98.4 %	90-110	
Fluoride	300.0	08/30/12:209694CHL	LCS	mg/L	2.500	92.8 %	90-110	
			MS	mg/L	50.00	94.1 %	81-126	
		(SP 1208765-001)	MSD	mg/L	50.00	94.2 %	81-126	
			MSRPD	mg/L	100.0	0.2%	≤12.1	
	300.0	08/30/12:212905CHL	ICV	ppm	5.000	90.4 %	90-110	
			ICB	ppm		-0.048	0.1	
			CCB	ppm		-0.048	0.1	
			CCV	ppm	2.500	93.1 %	90-110	
Nitrate	300.0	08/30/12:209694CHL	LCS	mg/L	20.00	97.5 %	90-110	
			MS	mg/L	400.0	99.8 %	88-124	
		(SP 1208765-001)	MSD	mg/L	400.0	100 %	88-124	
			MSRPD	mg/L	100.0	0.4%	≤29.1	
	300.0	08/30/12:212905CHL	ICV	ppm	40.00	97.5 %	90-110	
			ICB	ppm		-0.338	0.4	
			CCB	ppm		-0.351	0.4	
			CCV	ppm	20.00	96.6 %	90-110	
Nitrite	300.0	08/30/12:209694CHL	LCS	mg/L	15.00	106 %	90-110	
			MS	mg/L	300.0	102 %	91-121	
		(SP 1208765-001)	MSD	mg/L	300.0	101 %	91-121	
			MSRPD	mg/L	100.0	0.7%	≤23.8	
	300.0	08/30/12:212905CHL	ICV	ppm	30.00	101 %	90-110	
			ICB	ppm		-0.144	0.3	
			CCB	ppm		-0.135	0.3	
			CCV	ppm	15.00	105 %	90-110	
Sulfate	300.0	08/30/12:209694CHL	LCS	mg/L	50.00	99.0 %	90-110	
			MS	mg/L	1000	101 %	78-137	
		(SP 1208765-001)	MSD	mg/L	1000	101 %	78-137	
			MSRPD	mg/L	100.0	0.3%	≤12.3	
	300.0	08/30/12:212905CHL	ICV	ppm	100.0	99.0 %	90-110	
			ICB	ppm		-1.14	2	
			CCB	ppm		-0.53	2	
			CCV	ppm	50.00	99.2 %	90-110	
Perchlorate	314.0	09/13/12:210197CHL	Blank	ug/L		ND	<2	
			LCS	ug/L	25.02	108 %	80-120	
			MS	ug/L	25.02	114 %	80-120	
		(CC 1282770-001)	MSD	ug/L	25.02	108 %	80-120	
			MSRPD	ug/L	25.02	6.1%	≤20	
	314.0	09/13/12:213479CHL	ICB	ppb		0.00	1.0	
			ICV	ppb	2.002	106 %	85-115	
			CCV	ppb	10.01	98.6 %	85-115	
			CCV	ppb	10.01	105 %	85-115	
			CCV	ppb	10.01	109 %	85-115	
Cyanide	4500CNCE	08/31/12:212797AMM	CCV	mg/L	0.1000	98.7 %	90-110	

October 8, 2012 Lab ID : SP 1208765
Thomas Harder & Co. Customer : 2-24140

Quality Control - Inorganic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Wet Chem								
Cyanide	4500CNCE	08/31/12:212797AMM	CCB	mg/L		0.00063	0.004	
			CCV	mg/L	0.1000	94.5 %	90-110	
			CCB	mg/L		0.00016	0.004	
Cyanide, Total	4500CNCE	08/29/12:209622AMM	Blank	mg/L		ND	<0.004	
			LCS	mg/L	0.1000	93.6 %	90-110	
			LCS	mg/L	0.4000	97.9 %	90-110	
			MS	mg/L	0.05000	107 %	5-223	
		(SP 1208368-006)	MSD	mg/L	0.05000	110 %	5-223	
			MSRPD	mg/L	0.05000	2.6%	≤10.0	
pH	4500-H B	(SP 1208491-001)	Dup	units		0.0%	4.80	
	4500HB	08/29/12:212723CJJ	CCV	units	8.000	100 %	95-105	
			CCV	units	8.000	101 %	95-105	
MBAS	5540C	08/30/12:212788JAM	CCB	mg/L		0.000	0.1	
			CCV	mg/L	10.00	100 %	99-101	
MBAS Screen	5540C	(STK1237943-001)	MS	mg/L	10.00	100 %	90-110	
			MSD	mg/L	10.00	100 %	90-110	
			MSRPD	mg/L	10.00	0.0	≤0.1	

Definition

ICV	: Initial Calibration Verification - Analyzed to verify the instrument calibration is within criteria.
ICB	: Initial Calibration Blank - Analyzed to verify the instrument baseline is within criteria.
CCV	: Continuing Calibration Verification - Analyzed to verify the instrument calibration is within criteria.
CCB	: Continuing Calibration Blank - Analyzed to verify the instrument baseline is within criteria.
Blank	: Method Blank - Prepared to verify that the preparation process is not contributing contamination to the samples.
LCS	: Laboratory Control Standard/Sample - Prepared to verify that the preparation process is not affecting analyte recovery.
MS	: Matrix Spikes - A random sample is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.
MSD	: Matrix Spike Duplicate of MS/MSD pair - A random sample duplicate is spiked with a known amount of analyted. The recoveries are an indication of how that sample matrix affects analyte recovery.
Dup	: Duplicate Sample - A random sample with each batch is prepared and analyzed in duplicate. The relative percent difference is an indication of precision for the preparation and analysis.
MSRPD	: MS/MSD Relative Percent Difference (RPD) - The MS relative percent difference is an indication of precision for the preparation and analysis.
ND	: Non-detect - Result was below the DQO listed for the analyte.
DQO	: Data Quality Objective - This is the criteria against which the quality control data is compared.

Explanation

435	: Sample matrix may be affecting this analyte. Data was accepted based on the LCS or CCV recovery.
440	: Sample nonhomogeneity may be affecting this analyte. Data was accepted based on the LCS or CCV recovery.

October 8, 2012 Lab ID : SP 1208765
Thomas Harder & Co. Customer : 2-24140

Quality Control - Radio

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Radio								
Alpha	900.0	09/11/12:213450caa	CCV	cpm	9721	40.0 %	40 - 49	
			CCB	cpm		0.100	0.12	
	900.0	09/11/12:213451caa	CCV	cpm	9721	42.5 %	40 - 49	
			CCB	cpm		0.1400	0.19	
Gross Alpha	900.0	09/11/12:209973CAA	Blank	pCi/L		0.45	3	
			LCS	pCi/L	155.2	114 %	75-125	
			MS	pCi/L	155.2	115 %	60-140	
		(CH 1275588-001)	MSD	pCi/L	155.2	108 %	60-140	
			MSRPD	pCi/L	155.2	6.8%	≤30	
Alpha	908.0	09/19/12:213936CAA	CCV	cpm	9715	40.5 %	40 - 49	
			CCB	cpm		0.1400	0.15	
Uranium	908.0	09/17/12:210277caa	RgBlk	pCi/L		0.10	1	
			LRS	pCi/L	21.48	86.2 %	54-105	
			BS	pCi/L	21.48	86.7 %	75-125	
			BSD	pCi/L	21.48	84.8 %	75-125	
			BSRPD	pCi/L	21.48	2.3%	≤20	

Definition

CCV	: Continuing Calibration Verification - Analyzed to verify the instrument calibration is within criteria.
CCB	: Continuing Calibration Blank - Analyzed to verify the instrument baseline is within criteria.
Blank	: Method Blank - Prepared to verify that the preparation process is not contributing contamination to the samples.
RgBlk	: Method Reagent Blank - Prepared to correct for any reagent contributions to sample result.
LCS	: Laboratory Control Standard/Sample - Prepared to verify that the preparation process is not affecting analyte recovery.
LRS	: Laboratory Recovery Standard - Prepared to establish the batch recovery factor used in result calculations.
MS	: Matrix Spikes - A random sample is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.
MSD	: Matrix Spike Duplicate of MS/MSD pair - A random sample duplicate is spiked with a known amount of analyted. The recoveries are an indication of how that sample matrix affects analyte recovery.
BS	: Blank Spikes - A blank is spiked with a known amount of analyte. It is prepared to verify that the preparation process is not affecting analyte recovery.
BSD	: Blank Spike Duplicate of BS/BSD pair - A blank duplicate is spiked with a known amount of analyte. It is prepared to verify that the preparation process is not affecting analyte recovery.
MSRPD	: MS/MSD Relative Percent Difference (RPD) - The MS relative percent difference is an indication of precision for the preparation and analysis.
BSRPD	: BS/BSD Relative Percent Difference (RPD) - The BS relative percent difference is an indication of precision for the preparation and analysis.
DQO	: Data Quality Objective - This is the criteria against which the quality control data is compared.

ENVIRONMENTAL

www.fglinc.com

CHAIN OF CUSTODY
AND ANALYSIS REQUEST DOCUMENT

ORIGINAL

CLIENT DETAILS — SECTION I

Client: Thomas Harder & Co.

❑ New Customer Customer Number: _____

Address: 801 E. Yorba Linda Blvd
Suite 3a Placentia, CA 92870

Phone: (714) 792-3875 FAX: _____

E-Mail: THarder@ThomasHardercompany.com

Project name: Stockdale East/West H_2O Sampling

Contact person: Tom Harder

Billing Information (if different from above)

Name: _____

Address: Same

Phone: _____ FAX: _____

E-Mail: _____

Contact person: _____

Purchase order/contract/FGL quote number: _____

Pre Log Required: yes _____ Frequency: Monthly ❑ Weekly ❑ Quarterly ❑ Other ❑ _____

SAMPLING — SECTION II

Sampler (s): Andrew Hausheer

Comp Sampler Set up Date: _____ Time: _____

Time: _____ Mileage: _____

Shipping Charge: _____ Pickup Charge: _____

REPORT INFORMATION — SECTION III

Rush Analysis (surcharge will apply):

❑ 5 Day ❑ 4 Day ❑ 3 Day

❑ 2 Day ❑ 24 hour

Rush pre-approval by lab: _____ Initial

Electronic Data Transfer: yes _____ no _____

If yes, To: State _____ Client ✓ Other _____

Lab number: 1108765

SAMPLE INFORMATION — SECTION IV

Sample Number	Location/Description	Date Sampled	Time Sampled	Type of Sampling: Composite(C) Grab(G)	Number of Containers	Type of Containers: (G) Glass (P) Plastic (V) VOA (MT) Metal Tube	(P) Potable (NP) Non-Potable	(SW) Surface Water (MW) Monitoring Well (GW) Ground Water (TB) Travel Blank (AgW) Ag Water (WW) Wastewater (DW) Drinking Water	(S) Soil (SLG) Sludge (SLD) Solid (O) Oil	BacT: (Sys) System (SRC) Source (W) Waste	BacT: Routine (ROUT) Repeat (RPT) Other (OTH) Replace (RPL)	(LT) Leaf Tissue (PET) Petiole Tissue (PRD) Produce	Preservative: (1) NaOH + ZnAc, (2) NaOH, (3) HCl, (4) H_2SO_4, (5) HNO_3, (6) $Na_2S_2O_3$, (7) Other	ANALYSES REQUESTED
1	Stockdale West	8-29-12	9:30am	G			NP	GW					see bottles	See attached analyte list - 2 pages
2	Stockdale East	"	10:30am	G			NP	GW						

REMARKS — SECTION V

CUSTODY — SECTION VI

Relinquished by and subject to the terms and conditions on the reverse of this document:

Relinquished by: _____ Date _____ Time _____

Received by: _____ Date _____ Time _____

Relinquished by: _____ Date _____ Time _____

Received by: _____ Date _____ Time _____

Relinquished by: _____ Date _____ Time _____

Received by: _____ Date _____ Time _____

Relinquished by: _____ Date _____ Time _____

Received by: _____ Date _____ Time _____

CORPORATE OFFICE & LABORATORY
853 Corporation Street
Santa Paula, CA 93060
Tel: (805) 392-2000
FAX: (805) 525-4172

OFFICE & LABORATORY
2500 Stagecoach Road
Stockton, CA 95215
Tel: (209) 942-0182
FAX: (209) 942-0423

OFFICE & LABORATORY
563 E. Lindo Avenue
Chico, CA 95926
Tel: (530) 343-5818
FAX: (530) 343-3807

FIELD OFFICE
Visalia, California
Tel: (559) 734-9473
Mobile: (559) 737-2399
FAX (559) 734-8435

Email

Date: June 1, 2012

To: **ThomasHarder**
Attn: Ben Lewis
Email: **blewis@thomashardercompany.com**

From: **Denis Barry - Marketing Director**
denisb@fglinc.com Phone: (805) 392-2032 Fax: (805) 525-4172

Subject: **Price Quote No: SP 20120601-02 Title 22 Analyses**

Dear Ben,

Hereunder is the price quote that you requested. Please use the price quote number SP 20120601-02 for further reference to this quote.

Quote For Time Period: June 01, 2012 through June 01, 2013
Sampled By: FGL Sampling

Constituent	Analytical Method	Price per Sample
General Mineral (Alkalinity, Boron, Calcium, Carbonate, Chloride, Copper, Aggressive Index, Bicarbonate, Fluoride, Foaming Agents, Hydroxide, Iron, Langlier Index, Magnesium, Manganese, Nitrate, Nitrite, pH, Potassium, Sodium, Sodium Absorption Ratio, Electrical Conductivity, Sulfate, Total Dissolved Solids, Total Hardness, Zinc)	Various	162.00
General Physical (Color, Odor, Turbidity)	Various	39.00
IOC Metals (Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Lead, Mercury, Nickel, Selenium, Silver, Thallium, Vanadium)	Various	155.00
Silica	EPA200.7/EPA200.8	24.00
Perchlorate	EPA 314.0	50.00
Total Cyanide (CN)	SM4500-CN C,E	69.00
Gross Alpha	EPA 900.0	43.00
EDB & DBCP	EPA 504.1	87.00
Chlorinated Pesticides	EPA 505	148.00
Nitrogen Phosphorus Pesticides	EPA 507	148.00
Herbicides	EPA 515.3	175.00
VOC's Full List	EPA 524.2	235.00
Semi-volatile	EPA 525.2	315.00
Carbamates	EPA 531.1	175.00
Glyphosate	EPA 547	175.00
Endothall	EPA 548.1	200.00
Diquat	EPA 549.2	175.00

Corporate Offices & Laboratory
853 Corporation Street
Santa Paula, CA 93060
TEL: 805/392-2000
FAX: 805/525-4172
CA NELAP Certification No. 01110CA

Office & Laboratory
2500 Stagecoach Road
Stockton, CA 95215
TEL: 209/942-0182
FAX: 209/942-0423
CA ELAP Certification No. 1563

Office & Laboratory
563 E. Lindo Avenue
Chico, CA 95926
TEL: 530/343-5818
FAX: 530/343-3807
CA ELAP Certification No. 2670

Office & Laboratory
3442 Empresa Drive, Suite D
San Luis Obispo, CA 93401
TEL: 805/783-2940
FAX: 805/525-4172
CA ELAP Certification No. 2775

Field Office
Visalia, California
TEL: 559/734-9473
Mobile: 559/737-2399
FAX: 559/734-8435

Constituent	Analytical Method	Price per Sample
Subcontracted: Asbestos (Drinking Water)	EPA 600/4-83	120.00
Subcontracted: Dioxin (AQ/Solid) - 2,3,7,8, TCDD Only	EPA 1613B/8290	465.00
Subcontracted: 1,4 Dioxane		175.00
	Total Price Quote:	**3135.00**

- *A Quality Assurance/Quality Control report is supplied with all of our analyses. This assures our valued clients of accurate and defensible data.*
- All work undertaken is subject to our terms and conditions, which are outlined in our fee schedule and/or available upon request.

If you have any questions relating to this quote, please do not hesitate to call us.

Reviewed and Approved By **Denis Barry** Marketing Director

Digitally signed by Denis Barry
Prepared By: Sara Brockus
Date: 2012-06-01 11:32

+ Uranium (radiological) $85

Hold Radium samples

Subcontract to
Test America Sacramento

Map Ref.

Client: **Fruit Growers Laboratory, Inc.**

Address: FGL Environmental, Inc.
853 Corporation St.
Santa Paula, CA 93060-3005

Phone: (805)392-2039 Fax: (805)525-6264

Contact Person:

Project Name: **SP 1208765 - (2-24140)**

Purchase Order Number:

Sampler(s) Andrew Hausheer

Compositor Setup Date: ___/___/___ Time: ___/___

Lab Number:

Samp Num	Location Description	Date Sampled	Time Sampled	Method of Sampling: Composite(C) Grab(G)	Type of Sample **SEE REVERSE SIDE**	Potable(P) Non-Potable(NP) Ag Water(AgW)	Bacti Type: Other(O) System(SYS) Source(SR) Waste(W)	Bacti Reason: Routine(ROUT) Repeat(RPT) Replace(RPL) Other(O) Special(SPL)	Dioxin-Dioxin EPA 1613B (2,3,7,8 TCDD Only) 1000ml(AGT)									
1	Stockdale West	08/29/12	09:30	G	GW				21									
2	Stockdale East	08/29/12	10:30	G	GW				21									

Remarks:

Relinquished	Date:	Time:	Relinquished	Date:	Time:	Relinquished	Date:	Time:
Received By:	Date:	Time:	Received By:	Date:	Time:	Received By:	Date:	Time:

Subcontract to
EMS Laboratories, Inc.

Map Ref.

Client: **Fruit Growers Laboratory, Inc.**

Address: FGL Environmental, Inc.
853 Corporation St.
Santa Paula, CA 93060-3005

Phone: (805)392-2039 Fax: (805)525-6264

Contact Person:

Project Name: **SP 1208765 - (2-24140)**

Purchase Order Number:

Sampler(s) Andrew Hausheer

Compositor Setup Date: ___/___/___ Time: ___/___

Lab Number:

Samp Num	Location Description	Date Sampled	Time Sampled	Method of Sampling: Composite(C) Grab(G)	Type of Sample **SEE REVERSE SIDE**	Potable(P) Non-Potable(NP) Ag Water(AgW)	Bacti Type: Other(O) System(SYS) Source(SR) Waste(W)	Bacti Reason: Routine(ROUT) Repeat(RPT) Replace(RPL) Other(O) Special(SPL)	Asbestos-Drinking Water 32oz(P)									
1	Stockdale West	08/29/12	09:30	G	GW				1									
2	Stockdale East	08/29/12	10:30	G	GW				1									

Remarks:

Relinquished	Date:	Time:	Relinquished	Date:	Time:	Relinquished	Date:	Time:
Received By:	Date:	Time:	Received By:	Date:	Time:	Received By:	Date:	Time:

Subcontract to
Weck Laboratories, Inc.

Map Ref.

Client: **Fruit Growers Laboratory, Inc.**

Address: FGL Environmental, Inc.
853 Corporation St.
Santa Paula, CA 93060-3005

Phone: (805)392-2039 Fax: (805)525-6264

Contact Person:

Project Name: **SP 1208765 - (2-24140)**

Purchase Order Number:

Sampler(s) Andrew Hausheer

Compositor Setup Date: ____/____/____ Time: ____/____

Lab Number:

Samp Num	Location Description	Date Sampled	Time Sampled	Method of Sampling: Composite(C) Grab(G)	Type of Sample **SEE REVERSE SIDE**	Potable(P) Non-Potable(NP) Ag Water(AgW)	Bacti Type: Other(O) System(SYS) Source(SR) Waste(W)	Bacti Reason: Routine(ROUT) Repeat(RPT) Replace(RPL) Other(O) Special(SPL)	Sub Contracted-EPA 525.2 1000ml(AGT)	Sub Contracted-1,4 Dioxane 1000ml(AGJ)								
0	Travel Blank	08/29/12	00:00	G	LBW				1									
1	Stockdale West	08/29/12	09:30	G	GW				1	1								
2	Stockdale East	08/29/12	10:30	G	GW				1	1								

Remarks:

Relinquished	Date:	Time:	Relinquished	Date:	Time:	Relinquished	Date:	Time:
Received By:	Date:	Time:	Received By:	Date:	Time:	Received By:	Date:	Time:

Santa Paula - Condition Upon Receipt (Attach to COC)

Sample Receipt:

1. Number of ice chests/packages received: **OTC**
   Note as OTC if received over the counter unpackaged
2. Were samples received in a chilled condition? Temps: **ROI** / _____ / _____ / _____

   Acceptable is above 2 to 6 C. Also acceptable is received on ice (ROI) for the same day of sampling or received at room temperature (RRT) if sampled within one hour of receipt. Client contact for temperature failures must be documented below. If many packages are received at one time check for tests/H.T.'s/rushes/Bacti's to prioritize further review. Please notify Microbiology personnel immediately of bacti samples received.
3. Do the number of bottles received agree with the COC? **Yes** / No / N/A
4. Were the samples received intact? (i.e. no broken bottles, leaks, etc.) **Yes** / No
5. Were sample custody seals intact? Yes / No / **N/A**

Sign and date the COC, obtain LIMS sample numbers, select methods/test and print labels.

Sample Verification, Labeling and Distribution:

1. Were all requested analyses understood and acceptable? **Yes** / No
2. Did bottle labels correspond with the client's ID's? **Yes** / No
3. Were all bottles requiring sample preservation properly preserved? **Yes** / No / N/A **FGL**
4. VOAs checked for Headspace? **Yes** / No / N/A
5. Were all analyses within holding times at time of reciept? Yes / **No**
6. Have rush or project due dates been checked and accepted? Yes / No / **N/A**

Attach lables to the containers and include a copy of the COC for lab delivery
Sample Receipt, Login and Verification completed by (initials):

Reviewed and Approved By **Shawn Peck** Digitally signed by Shawn Peck
Title: Sample Receiving
Date: 08/29/2012-16:46:08

Discrepency Documentation:

Any items above which are "No" or do not meet specifications (i.e. temps) must be resolved.

1. Person Contacted: Tom Harder | Phone Number: (714)792-3875
   Initiated By: srp | Date: 2012-08-29
   Problem: **pH received past h/t**

   Resolution: **Okay to run in lab past h/t per Tom Harder 8/29/12**

2. Person Contacted: _____ | Phone Number: _____
   Initiated By: srp | Date: 2012-08-29
   Problem: **-1 524.2 voas = 3 voas had large h/s 1 voa had small h/s**

   Resolution: **Analysis will be run out of voa with small h/s**

(2024140)
Thomas Harder & Co.
SP 1208765
SRP-08/29/2012-16:46:08

1260 N. Hancock St., Suite 109
Anaheim, CA 92807
(714) 779-3875
tharder@thomashardercompany.com
www.ThomasHarderCompany.com

Thomas Harder & Co.
Groundwater Consulting

IRVINE RANCH WATER DISTRICT

Rosedale-Rio Bravo WATER STORAGE DISTRICT

APPENDIX F

Cross Valley Canal Operating Guidelines during Shallow Groundwater Conditions

August 12, 2011

CROSS VALLEY CANAL / STOCKDALE WEST RANCH PILOT PROJECT

OPERATING GUIDELINES DURING SHALLOW GROUNDWATER CONDITIONS

1. INTRODUCTION

The Irvine Ranch Water District (IRWD) and Rosedale Rio Bravo Water Storage District (RRBWSD) have developed the Stockdale West Ranch Pilot Project (SWRPP) for use by both districts. All groundwater banking facilities on the Stockdale West Ranch are owned by IRWD and operated and maintained by RRBWSD. The SWRPP operates within township 30 south, range 25 east, section 3, within the Kern Fan element of the San Joaquin groundwater basin. The Kern County Water Agency (KCWA) owns and operates the Cross Valley Canal (CVC). SWRPP recharge basins exist on the north side of the CVC, as shown on Figure 1. The KCWA and SWRPP contribute to water supply management and conservation in Kern County. RRBWSD and KCWA staffs have developed these operating guidelines for periods of shallow groundwater conditions in order to allow the SWRPP to operate to the fullest extent possible while at the same time being protective of CVC facilities.

Shallow groundwater conditions, as used throughout these operating guidelines, are defined to occur when the unconfined aquifer's water levels measured at well SROW-3/1 are less than 20 feet below the invert of the CVC at cross section "B-B" (figure 1), which corresponds to a water level of 46.18 feet below the top of the SROW-3/1 casing. Well SROW-3 is one of three triple-nested piezometers constructed at the Strand Ranch that measures water levels in the unconfined, leaky confining and semi-confining aquifer system. The identifier SROW-3/1 refers to the piezometer located nearest the CVC that is perforated between 220 to 270 feet below ground surface and measures water levels in the unconfined aquifer.

There are several other water banks that operate in the vicinity of the CVC that have established their own operating guidelines to protect the CVC facilities from adverse impacts from water banking operations. Specifically, the KCWA and the Kern Water Bank Authority (KWBA) have implemented a number of proactive facility protection measures, including but not limited to, installing a shallow groundwater monitoring network, conducting regular groundwater monitoring, evaluation of shallow groundwater conditions, and enhancing or installing new operational controls on the CVC. In addition, the KCWA and KWBA have developed operating guidelines during shallow groundwater conditions that specify piezometer installation, groundwater monitoring frequency and evaluation of groundwater conditions (October 16, 2000).

Implementation of the following SWRPP operating guidelines should further these existing efforts to protect CVC facilities and, at the same time, allow for project flexibility. It is expected that, as time goes on and additional information is developed, modifications to these operating guidelines may be made.

2. SWRPP GROUNDWATER MONITORING PROGRAM

The SWRPP operating guidelines were developed using the KCWA and KWBA agreement as a model. In addition, it includes the environmental commitment to monitor for groundwater mounding listed in Exhibit B of the SWRPP Notice of Exemption (May 16, 2011) that was developed to avoid potential impacts to underground structures and adjacent groundwater banking operations. Similar to the KCWA and KWBA guidelines, the SWRPP operating guidelines consist of three major components; piezometer installation, groundwater monitoring and evaluation of groundwater conditions. Each of these aspects of the program is described below.

Piezometer Installation

IRWD will install piezometers and RRBWSD will monitor water levels at the SWRPP property. IRWD will pay all direct costs of installation and RRBWSD will maintain the piezometers. Three triple-nested piezometers have already been installed to monitor groundwater conditions at each of the major aquifer formations beneath the Strand Ranch. Four additional shallow piezometers (SW-1 thru SW-4) will be installed at the locations and depths shown in Figure 1 to monitor shallow groundwater conditions on the SWRPP near the CVC. As shown in Figure 2, the four shallow piezometers will be constructed with 2-inch diameter PVC to industry standard specifications. A licensed surveyor will determine the location and elevation of each. As-built coordinates will be provided to KCWA upon completion of the installations.

Groundwater Monitoring Frequency

RRBWSD will monitor and record the groundwater levels at each of the 3 triple-nested piezometers on the Strand Ranch and 4 shallow piezometers located on the SWRPP. Groundwater level information will be provided to KCWA by electronic mail in a format specified by KCWA. The frequency of groundwater monitoring will vary as groundwater levels change. SROW-3/1 will serve as a sentry well for shallow groundwater, and groundwater levels will be measured in SROW-3/1 on a quarterly basis or more frequently if water levels are known to be rising to levels of concern. If during groundwater monitoring the water level in SROW-3/1 is equal to or less than 46.18 feet below the top of the casing (20 feet below the invert of the CVC at the SWRPP), the monitoring schedule will include the monitoring of water levels at the 4 SWRPP shallow piezometers as follows:

During periods of recharge:

- Groundwater > 20 feet below the invert of the CVC at SWRPP – monitor monthly
- Groundwater < 20 feet below the invert of the CVC at SWRPP – monitor weekly

During periods with no recharge – monitor weekly until depth to groundwater is > 20 feet below the invert of the CVC at SWRPP, then monitor semi-annually.

Evaluation of Groundwater Conditions

KCWA and RRBWSD staff will jointly evaluate groundwater conditions based on SWRPP monitoring results and other regional data provided by the KCWA. Based on this evaluation, KCWA and RRBWSD will, as necessary, determine appropriate modifications to operations as described in these guidelines. These evaluations will be conducted according to the following schedule where SWRPP groundwater levels are measured at well SROW 3/1 and adjusted to represent the depth to groundwater from the invert of the CVC canal closest to well SROW 3/1:

During periods of recharge:

- Groundwater < 50 feet below the invert of the CVC at SWRPP – evaluate monthly
- Groundwater < 20 feet below the invert of the CVC at SWRPP – evaluate weekly , prepare gradient maps weekly, prepare written recommendations regarding modifications to operations and submit to KCWA and RRBWSD
- Groundwater < 12 feet below the invert of the CVC at SWRPP - RRBWSD will obtain the opinion of a geotechnical engineer to determine if conditions might pose a risk to subsurface structures if further recharge operations were to continue at SWRPP. Under such conditions, all information used by the geotechnical engineer to form his opinion will be shared with KCWA. If the

geotechnical engineer's opinion determines subsurface structures may be at risk from high groundwater, RRBWSD will temporarily cease recharge activities until groundwater elevations no longer pose a risk to subsurface structures. (SWRPP Notice of Exemption, Exhibit B).

- Groundwater within 5 feet of design operational levels of the CVC – implement written recommendations from KCWA and RRBWSD regarding modifications to SWRPP operations.

During periods with no recharge:

- Groundwater < 20 feet below the invert of the CVC at SWRPP – evaluate weekly, prepare gradient maps monthly
- Groundwater > 20 feet below the invert of the CVC at SWRPP – evaluate semiannually
- Groundwater > 50 feet below the invert of the CVC at SWRPP – no evaluations

The evaluations are expected to consist of brief teleconferences between KCWA and RRBWSD staff unless depth to groundwater is within 20 feet below the invert of the CVC at SWRPP or less. Under these conditions and when recharge is occurring, written evaluations and recommendations will be prepared weekly as a joint effort by KCWA and RRBWSD staff.

3. GROUNDWATER RECHARGE MANAGEMENT

RRBWSD will manage SWRPP recharge operations to help ensure the groundwater elevation measured at well SROW 3/1 is below the invert of the CVC at SWRPP during shallow groundwater conditions. Should groundwater conditions develop that might induce piping behind the CVC's liner, RRBWSD will minimize recharge adjacent to the CVC either by reducing inflow to adjacent ponds or increasing the setbacks of adjacent ponds. The goal of these actions will be to prevent flow into the CVC.

It is important to note that controlling groundwater levels in the vicinity of the CVC cannot be entirely achieved by managing recharge. At times, the canal has been operated at levels above the liner, thereby recharging groundwater. As a result, groundwater elevations near the CVC are maintained at or above the level of the lining. Irrespective of the foregoing, the protective measures described above will be undertaken.

4. CVC OPERATIONS MANAGEMENT

KCWA's management of CVC operations will also play an important role in preventing future lining damage. During periods where shallow groundwater conditions exist, the CVC will be operated in such a manner as to maintain higher than normal pool levels**,** unless prohibited by delivery demands. Also, additional low-level cut-off float switches, adjustment of low-level alarms and improved monitoring of CVC forebay levels will be incorporated into CVC operations during periods where shallow groundwater conditions exist.

In addition to the above, regular inspections of the CVC's concrete liner will continue to be conducted, and any observed voids will be repaired promptly.

5. CONCLUSION

KCWA and RRBWSD staffs have developed these operating guidelines to maximize the flexibility of their respective projects while preventing structural damage to facilities. Both projects will work together to ensure that the goals of the guidelines are met. It is expected that these guidelines may be modified in

response to structural changes to the CVC (e.g. liner modifications) and as more knowledge is gained regarding the behavior of the shallow aquifer.

APPENDIX G

LESA Model and Manual

NOTES

4,965 ft [length]
x 60 ft [width, permanent right-of-way]
6.83 acres = Impact Area

Calculation of the Land Evaluation (LE) Score

Part 1. Land Capability Classification (LCC) Score:

(1) Determine the total acreage of the project.
(2) Determine the soil types within the project area and enter them in **Column A** of the **Land Evaluation Worksheet** provided on page 2-A.
(3) Calculate the total acres of each soil type and enter the amounts in **Column B**.
(4) Divide the acres of each soil type (**Column B**) by the total acreage to determine the proportion of each soil type present. Enter the proportion of each soil type in **Column C**.
(5) Determine the LCC for each soil type from the applicable Soil Survey and enter it in **Column D**.
(6) From the LCC Scoring Table below, determine the point rating corresponding to the LCC for each soil type and enter it in **Column E**.

LCC Scoring Table

LCC Class	I	IIe	IIs,w	IIIe	IIIs,w	IVe	IVs,w	V	VI	VII	VIII
Points	100	90	80	70	60	50	40	30	20	10	0

(7) Multiply the proportion of each soil type (**Column C**) by the point score (**Column E**) and enter the resulting scores in **Column F**.
(8) Sum the LCC scores in **Column F**.
(9) Enter the LCC score in box <1> of the **Final LESA Score Sheet** on page 10-A.

Part 2. Storie Index Score:

(1) Determine the Storie Index rating for each soil type and enter it in **Column G**.
(2) Multiply the proportion of each soil type (**Column C**) by the Storie Index rating (**Column G**) and enter the scores in **Column H**.
(3) Sum the Storie Index scores in **Column H** to gain the Storie Index Score.
(4) Enter the Storie Index Score in box <2> of the **Final LESA Score Sheet** on page 10-A.

Land Evaluation Worksheet

Land Capability Classification (LCC) and Storie Index Scores

A	B	C	D	E	F	G	H
Soil Map Unit	Project Acres	Proportion of Project Area	LCC	LCC Rating	LCC Score	Storie Index	Storie Index Score
hkh3	3.415	50%	IIIe	70	35	67	33.5
hk1x	1.707	25%	IIs	80	20	80	20
hk1y	1.707	25%	I	100	25	80	20
Totals	6.83	(Must Sum to 1.0)		***LCC Total Score***	75	***Storie Index Total Score***	73.5

Site Assessment Worksheet 1.

Project Size Score

	I	J	K
	LCC Class I - II	LCC Class III	LCC Class IV - VIII
		3.415	
	1.707		
	1.707		
Total Acres	3.415	3.415	
Project Size Scores	0	0	

Highest Project Size Score 0

NOTES

Calculation of the Site Assessment (SA) Score

Part 1. Project Size Score:.

(1) Using **Site Assessment Worksheet 1** provided on page 2-A, enter the acreage of each soil type from **Column B** in the **Column - I, J or K -** that corresponds to the LCC for that soil. (Note: While the Project Size Score is a component of the Site Assessment calculations, the score sheet is an extension of data collected in the Land Evaluation Worksheet, and is therefore displayed beside it).
(2) Sum **Column I** to determine the total amount of class I and II soils on the project site.
(3) Sum **Column J** to determine the total amount of class III soils on the project site.
(4) Sum **Column K** to determine the total amount of class IV and lower soils on the project site.
(5) Compare the total score for each LCC group in the Project Size Scoring Table below and determine which group receives the highest score.

Project Size Scoring Table

Class I or II		**Class III**		**Class IV or Lower**	
Acreage	Points	Acreage	Points	Acreage	Points
>80	100	>160	100	>320	100
60-79	90	120-159	90	240-319	80
40-59	80	80-119	80	160-239	60
20-39	50	60-79	70	100-159	40
10-19	30	40-59	60	40-99	20
10<	0	20-39	30	40<	0
		10-19	10		
		10<	0		

(6) Enter the **Project Size Score** (the highest score from the three LCC categories) in box <3> of the **Final LESA Score Sheet** on page 10-A.

NOTES

Part 2. Water Resource Availability Score:

(1) Determine the type(s) of irrigation present on the project site, including a determination of whether there is dryland agricultural activity as well.

(2) Divide the site into portions according to the type or types of irrigation or dryland cropping that is available in each portion. Enter this information in **Column B** of **Site Assessment Worksheet 2. - Water Resources Availability**.

(3) Determine the proportion of the total site represented for each portion identified, and enter this information in **Column C**.

(4) Using the Water Resources Availability Scoring Table, identify the option that is most applicable for each portion, based upon the feasibility of irrigation in drought and non-drought years, and whether physical or economic restrictions are likely to exist. Enter the applicable Water Resource Availability Score into **Column D**.

(5) Multiply the Water Resource Availability Score for each portion by the proportion of the project area it represents to determine the weighted score for each portion in **Column E**.

(6) Sum the scores for all portions to determine the project's total Water Resources Availability Score

(7) Enter the Water Resource Availability Score in box <4> of the **Final LESA Score Sheet** on page 10-A.

Site Assessment Worksheet 2. - Water Resources Availability

A	B	C	D	E
Project Portion	Water Source	Proportion of Project Area	Water Availability Score	Weighted Availability Score (C x D)
1	Groundwater	100%	80	80
2				
3				
4				
5				
6				
		(Must Sum to 1.0)	***Total Water Resource Score***	80

Water Resource Availability Scoring Table

Option	Non-Drought Years			Drought Years			WATER RESOURCE SCORE
	RESTRICTIONS			RESTRICTIONS			
	Irrigated Production Feasible?	Physical Restrictions ?	Economic Restrictions ?	Irrigated Production Feasible?	Physical Restrictions ?	Economic Restrictions ?	
1	YES	NO	NO	YES	NO	NO	100
2	YES	NO	NO	YES	NO	YES	95
3	YES	NO	YES	YES	NO	YES	90
4	YES	NO	NO	YES	YES	NO	85
5	YES	NO	NO	YES	YES	YES	80
6	YES	YES	NO	YES	YES	NO	75
7	YES	YES	YES	YES	YES	YES	65
8	YES	NO	NO	NO	-- --	-- --	50
9	YES	NO	YES	NO	-- --	-- --	45
10	YES	YES	NO	NO	-- --	-- --	35
11	YES	YES	YES	NO	-- --	-- --	30
12	Irrigated production not feasible, but rainfall adequate for dryland production in both drought and non-drought years						25
13	Irrigated production not feasible, but rainfall adequate for dryland production in non-drought years (but not in drought years)						20
14	Neither irrigated nor dryland production feasible						0

NOTES

Part 3. Surrounding Agricultural Land Use Score:

(1) Calculate the project's Zone of Influence (ZOI) as follows:

(a) a rectangle is drawn around the project such that the rectangle is the smallest that can completely encompass the project area.

(b) a second rectangle is then drawn which extends one quarter mile on all sides beyond the first rectangle.

(c) The ZOI includes all parcels that are contained within or are intersected by the second rectangle, less the area of the project itself.

(2) Sum the area of all parcels to determine the total acreage of the ZOI.

(3) Determine which parcels are in agricultural use and sum the areas of these parcels

(4) Divide the area in agriculture found in step (3) by the total area of the ZOI found in step (2) to determine the percent of the ZOI that is in agricultural use.

(5) Determine the Surrounding Agricultural Land Score utilizing the Surrounding Agricultural Land Scoring Table below.

Surrounding Agricultural Land Scoring Table

Percent of ZOI in Agriculture	Surrounding Agricultural Land Score
90-100	100
80-89	90
75-79	80
70-74	70
65-69	60
60-64	50
55-59	40
50-54	30
45-49	20
40-44	10
<40	0

(5) Enter the Surrounding Agricultural Land Score in box <5> of the **Final LESA Score Sheet** on page 10-A.

Site Assessment Worksheet 3.
Surrounding Agricultural Land and Surrounding Protected Resource Land

A	B	C	D	E	F	G
Zone of Influence					Surrounding Agricultural Land Score (From Table)	Surrounding Protected Resource Land Score (From Table)
Total Acres	Acres in Agriculture	Acres of Protected Resource Land	Percent in Agriculture (A/B)	Percent Protected Resource Land (A/C)		
1,183	689	127	58.2%	10.7%	40	0

NOTES

Part 4. Protected Resource Lands Score:

The Protected Resource Lands scoring relies upon the same Zone of Influence information gathered in Part 3, and figures are entered in Site Assessment Worksheet 3, which combines the surrounding agricultural and protected lands calculations.

(1) Use the total area of the ZOI calculated in Part 3. for the Surrounding Agricultural Land Use score.
(2) Sum the area of those parcels within the ZOI that are protected resource lands, as defined in the California Agricultural LESA Guidelines.
(3) Divide the area that is determined to be protected in Step (2) by the total acreage of the ZOI to determine the percentage of the surrounding area that is under resource protection.
(4) Determine the Surrounding Protected Resource Land Score utilizing the Surrounding Protected Resource Land Scoring Table below.

Surrounding Protected Resource Land Scoring Table

Percent of ZOI Protected	Protected Resource Land Score
90-100	100
80-89	90
75-79	80
70-74	70
65-69	60
60-64	50
55-59	40
50-54	30
45-49	20
40-44	10
<40	0

(5) Enter the Protected Resource Land score in box <6> of the **Final LESA Score Sheet** on page 10-A.

NOTES

Final LESA Score Sheet

Calculation of the Final LESA Score:

(1) Multiply each factor score by the factor weight to determine the weighted score and enter in Weighted Factor Scores column.
(2) Sum the weighted factor scores for the LE factors to determine the total LE score for the project.
(3) Sum the weighted factor scores for the SA factors to determine the total SA score for the project.
(4) Sum the total LE and SA scores to determine the Final LESA Score for the project.

	Factor Scores	Factor Weight	Weighted Factor Scores
LE Factors			
Land Capability Classification	<1> 75	0.25	18.75
Storie Index	<2> 73.5	0.25	18.375
LE Subtotal		***0.50***	37.125
SA Factors			
Project Size	<3> 0	0.15	0
Water Resource Availability	<4> 80	0.15	12
Surrounding Agricultural Land	<5> 40	0.15	6
Protected Resource Land	<6> 0	0.05	0
SA Subtotal		***0.50***	18
		Final LESA Score	55.125

For further information on the scoring thresholds under the California Agricultural LESA Model, consult Section 4 of the Instruction Manual.

CALIFORNIA AGRICULTURAL

LAND EVALUATION AND SITE ASSESSMENT MODEL

Instruction Manual

For further information, please contact:

California Department of Conservation
Office of Land Conservation
801 K Street, MS 13-71
Sacramento, CA 95814-3528
(916) 324-0850
FAX (916) 327-3430

CALIFORNIA AGRICULTURAL

LAND EVALUATION AND SITE ASSESSMENT MODEL

Instruction Manual
1997

Department of Conservation
Office of Land Conservation

TABLE OF CONTENTS

Page

Executive Summary 1

Introduction 2

Defining the Land Evaluation and Site Assessment System 2
Background on Land Evaluation and Site Assessment Nationwide 2
Development of the California Agricultural Land Evaluation and Site Assessment Model 3

The California Agricultural Land Evaluation and Site Assessment Model 6

Section I. Required Resources and Information 6
Section II. Defining and Scoring the California Agricultural Land Evaluation and Site Assessment Factors 7

A. Scoring of Land Evaluation Factors 7
1. The Land Capability Classification Rating 10
2. The Storie Index Rating 12
B. Scoring of Site Assessment Factors 13
1. The Project Size Rating 13
2. The Water Resources Availability Rating 16
3. The Surrounding Agricultural Land Rating 23
4. The Surrounding Protected Resource Land Rating 28

Section III. Weighting of Factors and Final Scoring 29
Section IV. Scoring Thresholds for Making Determinations of Significance under CEQA 31
Bibliography 32
Appendix A. Abridged set of California LESA step-by-step scoring instructions A-1
Appendix B. Application of the California LESA Model to a hypothetical proposed project B-1

EXECUTIVE SUMMARY

Land Evaluation and Site Assessment (LESA) is a term used to define an approach for rating the relative quality of land resources based upon specific measurable features. The formulation of a California Agricultural LESA Model is the result of Senate Bill 850 (Chapter 812 /1993), which charges the Resources Agency, in consultation with the Governor's Office of Planning and Research, with developing an amendment to Appendix G of the California Environmental Quality Act (CEQA) Guidelines concerning agricultural lands. Such an amendment is intended "to provide lead agencies with an optional methodology to ensure that significant effects on the environment of agricultural land conversions are quantitatively and consistently considered in the environmental review process" (Public Resources Code Section 21095).

The California Agricultural LESA Model is composed of six different factors. Two Land Evaluation factors are based upon measures of soil resource quality. Four Site Assessment factors provide measures of a given project's size, water resource availability, surrounding agricultural lands, and surrounding protected resource lands. For a given project, each of these factors is separately rated on a 100 point scale. The factors are then weighted relative to one another and combined, resulting in a single numeric score for a given project, with a maximum attainable score of 100 points. It is this project score that becomes the basis for making a determination of a project's potential significance, based upon a range of established scoring thresholds. This Manual provides detailed instructions on how to utilize the California LESA Model, and includes worksheets for applying the Model to specific projects.

INTRODUCTION

Defining the LESA System

The Land Evaluation and Site Assessment (LESA) system is a point-based approach that is generally used for rating the relative value of agricultural land resources. In basic terms, a given LESA model is created by defining and measuring two separate sets of factors. The first set, Land Evaluation, includes factors that measure the inherent soil-based qualities of land as they relate to agricultural suitability. The second set, Site Assessment, includes factors that are intended to measure social, economic, and geographic attributes that also contribute to the overall value of agricultural land. While this dual rating approach is common to all LESA models, the individual land evaluation and site assessment factors that are ultimately utilized and measured can vary considerably, and can be selected to meet the local or regional needs and conditions for which a LESA model is being designed to address. In short, the LESA methodology lends itself well to adaptation and customization in individual states and localities. Considerable additional information on LESA may be found in *A Decade with LESA - the Evolution of Land Evaluation and Site Assessment* (8).

Background on LESA Nationwide

In 1981, the federal Natural Resources Conservation Service (NRCS), known then as the Soil Conservation Service, released a new system that was designed to provide objective ratings of the agricultural suitability of land compared to demands for nonagricultural uses of lands. The system became known as Land Evaluation and Site Assessment, or LESA. Soon after it was designed, LESA was adopted as a procedural tool at the federal level for identifying and addressing the potential adverse effects of federal programs (e.g., funding of highway construction) on farmland protection. The Farmland Protection Policy Act of 1981 (5) spells out requirements to ensure that federal programs, to the extent practical, are compatible with state, local, and private programs and policies to protect farmland, and calls for the use of LESA to aid in this analysis. Typically, staff of the NRCS is involved in performing LESA scoring analyses of individual projects that involve other agencies of the federal government.

Since its inception, the LESA approach has received substantial attention from state and local governments as well. Nationwide, over two hundred jurisdictions have developed local LESA methodologies (7). One of the attractive features of the LESA approach is that it is well suited to being modified to reflect regional and local conditions. Typical local applications of LESA include assisting in decision making concerning the sitting of projects, changes in zoning, and spheres of influence determinations. LESA is

also increasingly being utilized for farmland protection programs, such as the identification of priority areas to concentrate conservation easement acquisition efforts.

Because of the inherent flexibility in LESA model design, there is a broad array of factors that a given LESA model can utilize. Some LESA models require the measurement of as many as twenty different factors. Over the past 15 years, the body of knowledge concerning LESA model development and application has begun to indicate that LESA models utilizing only several basic factors can capture much of the variability associated with the determination of the relative value of agricultural lands. In fact, LESA models with many factors are increasingly viewed as having redundancies, with different factors essentially measuring the same features, or being highly correlated with one another. Additional information on the evolution and development of the LESA approach is provided in, A *Decade with LESA -The Evolution of Land Evaluation and Site Assessment* (8).

Development of the California Agricultural LESA Model

In 1990 the Department of Conservation commissioned a study to investigate land use decisions that affect the conversion of agricultural lands in California. The study, conducted by Jones and Stokes Associates, Inc., was prepared in response to concerns about agricultural land conversion identified in the *California Soil Conservation Plan* (1) (developed by the ad hoc Soil Conservation Advisory Committee serving the Department of Conservation in 1987). Among these concerns was the belief that there was inadequate information available concerning the socioeconomic and environmental implications of farmland conversions, and that the adequacy of current farmland conversion impact analysis under the California Environmental Quality Act (CEQA) was not fully known. The findings of this study are included in the publication, *The Impacts of Farmland Conversion in California* (2).

Currently, neither CEQA nor the State CEQA Guidelines contains procedures or specific guidance concerning how agencies should address farmland conversion impacts of projects. The only specific mention of agricultural issues is contained in Appendix G of the State CEQA Guidelines, which states that a project will normally have a significant effect on the environment if it will “convert prime agricultural land to non-agricultural use or impair the agricultural productivity of prime agricultural land”.

Among the conclusions contained in *The Impacts of Farmland Conversion in California* study was that the lack of guidance in how lead agencies should address the significance of farmland conversion impacts resulted in many instances of no impact analysis at all. A survey of environmental documents sent to the Governor's Office of Planning and Research (OPR) between 1986 and 1988 was performed. The survey

showed that among projects that affected at least 100 acres of land and for which agriculture was a project issue, nearly 30 percent received Negative Declarations, and therefore did not did not receive the environmental impact analysis that would be provided by an Environmental Impact Report (EIR).

Of those projects involving the conversion of agricultural lands and being the subject of an EIR, the study found a broad range of approaches and levels of detail in describing the environmental setting, performing an impact analysis, and providing alternative mitigation measures. The only agricultural impacts found to be significant in the EIRs were those involving the direct removal of prime agricultural lands from production by the project itself. The focus on prime farmland conversion in the projects surveyed was deemed to be related to the narrow direction provided in Appendix G of the State CEQA Guidelines.

The formulation of a California LESA Model is the result of Senate Bill 850 (Chapter 812 /1993), which charges the Resources Agency, in consultation with the Governor's Office of Planning and Research, to develop an amendment to Appendix G of the California Environmental Quality Act (CEQA) Guidelines. Such an amendment is intended "to provide lead agencies with an optional methodology to ensure that significant effects on the environment of agricultural land conversions are quantitatively and consistently considered in the environmental review process" (Public Resources Code Section 21095). This legislation authorizes the Department of Conservation to develop a California LESA Model, which can in turn be adopted as the required amendment to Appendix G of the CEQA Guidelines.

Presentation of the California LESA Model

The California LESA Model is presented in this Manual in the following sections:

Section I. provides a listing of the information and tools that will typically be needed to develop LESA scores for individual projects.

Section II. provides step-by-step instructions for scoring each of the six Land Evaluation and Site Assessment factors that are utilized in the Model, with an explanation of the rationale for the use of each factor.

Section III. defines the assignment of weights to each of the factors relative to one another, and the creation of a final LESA score for a given project.

Section IV. assigns scoring thresholds to final LESA scores for the purpose of determining the significance of a given project under CEQA where the conversion of agricultural lands is a project issue.

Additionally:

Appendix A. provides an abridged set of step-by-step LESA scoring instructions that can be used and reproduced for scoring individual projects.

Appendix B. demonstrates the application of the California LESA Model to the scoring of a hypothetical project.

The California Agricultural LESA Model

Section I. Required Resources and Information

The California Land Evaluation and Site Assessment (LESA) Model requires the use and interpretation of basic land resource information concerning a given project. A series of measurements and calculations is also necessary to obtain a LESA score. Listed below are the materials and tools that will generally be needed to make these determinations.

Land Evaluation and Site Assessment calculations will require:

1. A calculator or other means of tabulating numbers

2. An accurately scaled map of the project area, such as a parcel map

3. A means for making acreage determinations of irregularly shaped map units. Options include, from least to most technical:

    - A transparent grid-square or dot-planimeter method of aerial measurement

    - A hand operated electronic planimeter

    - The automatic planimetry capabilities of a Geographic Information System (GIS)

4. A modern soil survey, generally produced by the USDA Natural Resources Conservation Service, which delineates the soil-mapping units for a given project. [Note: If modern soil survey information is not available for a given area of study, it may be necessary to draw upon the services of a professional soil scientist to perform a specific project survey].

5. Maps that depict land uses for parcels including and surrounding the project site, such as the Department of Conservation's Important Farmland Map series, the Department of Water Resources Land Use map series, or other appropriate information.

6. Maps or information that indicate the location of parcels including and surrounding the project site that are within agricultural preserves, are under public ownership, have conservation easements, or have other forms of long term commitments that are considered compatible with the agricultural use of a given project site.

Section II. Defining and Scoring the California Land Evaluation and Site Assessment Model Factors

This section provides detailed step-by-step instructions for the measurement and scoring of each of the Land Evaluation and Site Assessment factors that are utilized in the California Agricultural LESA Model, and is intended to serve as an introduction to the process of utilizing the Model. Once users are familiar with the Model, a more streamlined set of instructions and scoring sheets is available in Appendix A. In addition, the scoring of a hypothetical project is presented using these scoring sheets in Appendix B.

Scoring of Land Evaluation Factors

The California LESA Model includes two Land Evaluation factors that are separately rated:

1. The Land Capability Classification Rating
2. The Storie Index Rating

The information needed to make these ratings is typically available from soil surveys that have been conducted by the federal Natural Resources Conservation Service (formerly known as the Soil Conservation Service). Consultation should be made with NRCS staff (field offices exist in most counties) to assure that valid and current soil resource information is available for the project site. Copies of soil surveys are available at local field offices of the NRCS, and may also be available through libraries, city and county planning departments, the Cooperative Extension, and other sources. In addition, a Certified Professional Soil Scientist (CPSS) may also be consulted to obtain appropriate soil resource information for the project site. A directory of CPSS registered soil consultants is available through the Professional Soil Scientists Association of California, P.O. Box 3213, Yuba City, CA 95992-3213; phone: (916) 671-4276.

1) The USDA Land Capability Classification (LCC) - The LCC indicates the suitability of soils for most kinds of crops. Groupings are made according to the limitations of the soils when used to grow crops, and the risk of damage to soils when they are used in agriculture. Soils are rated from Class I to Class VIII, with soils having the fewest limitations receive the highest rating (Class I). Specific subclasses are also utilized to further characterize soils. An expanded explanation of the LCC is included in most soil surveys.

2) The Storie Index - The Storie Index provides a numeric rating (based upon a 100 point scale) of the relative degree of suitability or value of a given soil for intensive agriculture. The rating is based upon soil characteristics only. Four factors that represent the inherent characteristics and qualities of the soil are

considered in the index rating. The factors are: profile characteristics, texture of the surface layer, slope, and other factors (e.g., drainage, salinity).

In some situations, only the USDA Land Capability Classification information may be currently available from a given published soil survey. However, Storie Index ratings can readily be calculated from information contained in soil surveys by qualified soil scientists. Users are encouraged to seek assistance from NRCS staff or Certified Professional Soil Scientists to derive Storie Index information for the soils as well. If, however, limitations of time or resources restrict the derivation of Storie Index ratings for the soils within a region, it may be possible to adapt the Land Evaluation by relying solely upon the LCC rating. Under this scenario the LCC rating would account for 50 percent of the overall LESA factor weighting.

Identifying a Project's Soils

In order to rate the Land Capability Classification and Storie Index factors, the evaluator must identify the soils that exist on a given project site and determine their relative proportions. A **Land Evaluation Worksheet** (Table 1A.) is used to tabulate these figures, based upon the following:

Step 1.
Locate the project on the appropriate map sheet in the Soil Survey.

Step 2.
Photocopy the map sheet and clearly delineate the project boundaries on the map, paying close attention to the map scale.

Step 3.
Identify all of the soil mapping units existing in the project site (each mapping unit will have a different map unit symbol) and enter the each mapping unit symbol in **Column A** of the **Land Evaluation Worksheet** (Table 1A).

Step 4.
Calculate the acreage of each soil mapping unit present within the project site using any of the means identified in **Section 1**, **Required Resources and Information**, and enter this information in **Column B**.

Step 5.

Divide the acres of each soil mapping unit by the total project acreage to determine the proportion of each unit that comprises the project, and enter this information in Column C.

1. Land Evaluation - The Land Capability Classification Rating

Step 1.
In the Guide to Mapping Units typically found within soil surveys, identify the Land Capability Classification (LCC) designation (e.g., IV-e) for each mapping unit that has been identified in the project and enter these designations in **Column D** of the **Land Evaluation Worksheet** (Table 1A.).

Step 2.
From Table 2., **The Numeric Conversion of Land Capability Classification Units**, obtain a numeric score for each mapping unit, and enter these scores in **Column E**.

Step 3.
Multiply the proportion of each soil mapping unit (**Column C**) by the LCC points for each mapping unit (**Column E**) and enter the resulting scores in **Column F**.

Step 4.
Sum the LCC scores in **Column F** to obtain a single LCC Score for the project. Enter this LCC Score in **Line 1** of the **Final LESA Worksheet** (Table 8)

Table 2. Numeric Conversion of Land Capability Classification Units

Land Capability Classification	LCC Point Rating
I	100
IIe	90
IIs,w	80
IIIe	70
IIIs,w	60
IVe	50
IVs,w	40
V	30
VI	20
VII	10
VIII	0

Table 1A.
Land Evaluation Worksheet

Land Capability Classification (LCC) and Storie Index Scores

A	B	C	D	E	F	G	H
Soil Map Unit	Project Acres	Proportion of Project Area	LCC	LCC Rating	LCC Score	Storie Index	Storie Index Score
Totals		(Must Sum to 1.0)		***LCC Total***		***Storie Index Total***	

Table 1B.
Site Assessment Worksheet 1.

Project Size Score

	I	J	K
	LCC Class I - II	LCC Class III	LCC Class IV - VIII
Total Acres			
Project Size Scores			

Highest Project Size Score |

2. Land Evaluation - The Storie Index Rating Score

Step 1.
From the appropriate soil survey or other sources of information identified in Appendix C, determine the Storie Index Rating (the Storie Index Rating is already based upon a 100 point scale) for each mapping unit and enter these values in **Column G** of the **Land Evaluation Worksheet** (Table 1A.).

Step 2.
Multiply the proportion of each soil mapping unit found within the project (**Column C**) by the Storie Index Rating (**Column G**), and enter these scores in **Column H**.

Step 3.
Sum the Storie Index Rating scores in **Column H** to obtain a single Storie Index Rating score for the project. Enter this Storie Index Rating Score in **Line 2** of the **Final LESA Worksheet** (Table 8)

Scoring of Site Assessment Factors

The California LESA Model includes four Site Assessment factors that are separately rated:

1. **The Project Size Rating**
2. **The Water Resources Availability Rating**
3. **The Surrounding Agricultural Land Rating**
4. **The Surrounding Protected Resource Land Rating**

1. Site Assessment - The Project Size Rating

The Project Size Rating relies upon acreage figures that were tabulated under the Land Capability Classification Rating in Table 1A. The Project Size rating is based upon identifying acreage figures for three separate groupings of soil classes within the project site, and then determining which grouping generates the highest Project Size Score.

Step 1.
Using information tabulated in **Columns B** and **D** of the **Land Evaluation Worksheet** (Table 1A), enter acreage figures in **Site Assessment Worksheet 1. - Project Size** (Table 1B) using either **Column I, J,** or **K** for each of the soil mapping units in a given project.

Step 2.
Sum the entries in **Column I** to determine the total acreage of Class I and II soils on the project site.

Sum the entries in **Column J** to determine the total acreage of Class III soils on the project site.

Sum the entries in **Column K** to determine the total acreage of Class IV and lower rated soils on the project site.

Step 3.
For each of the three columns, apply the appropriate scoring plan provided in Table 3, **Project Size Scoring**, and enter the **Project Size Score** for each grouping in the **Site Assessment Worksheet 1. - Project Size** (Table 1B). Determine which column generates the highest score. The highest score becomes the overall **Project Size Score**. Enter this number in **Line 3** of the **Final LESA Scoresheet** (Table 8).

Table 3. Project Size Scoring

LCC Class I or II soils		LCC Class III soils		LCC Class IV or lower	
Acres	***Score***	***Acres***	***Score***	***Acres***	***Score***
80 or above	100	160 or above	100	320 or above	100
60-79	90	120-159	90	240-319	80
40-59	80	80-119	80	160-239	60
20-39	50	60-79	70	100-159	40
10-19	30	40-59	60	40-99	20
fewer than 10	0	20-39	30	fewer than 40	0
		10-19	10		
		fewer than 10	0		

Explanation of the Project Size Factor

The Project Size factor in the California Agricultural LESA Model was developed in cooperation with Nichols-Berman, a consulting firm under contract with the Department of Conservation. A thorough discussion of the development of this rating is presented by Nichols-Berman in a report to the Department entitled, *Statewide LESA Methodologies Report - Project Size and Water Resource Availability Factors* (3).

The inclusion of the measure of a project's size in the California Agricultural LESA Models is a recognition of the role that farm size plays in the viability of commercial agricultural operations. In general, larger farming operations can provide greater flexibility in farm management and marketing decisions. Certain economies of scale for equipment and infrastructure can also be more favorable for larger operations. In addition, larger operations tend to have greater impacts upon the local economy through direct employment, as well as impacts upon support industries (e.g., fertilizers, farm equipment, and shipping) and food processing industries.

While the size of a given farming operation may in many cases serve as a direct indicator of the overall economic viability of the operation, The California Agricultural LESA Model does not specifically consider the issue of economic viability. The variables of economic viability for a specific farm include such factors as the financial management and farming skills of the operator, as well as the debt load and interest rates being paid by an individual operator, which are issues that cannot readily be included in a statewide LESA model.

In terms of agricultural productivity, the size of a farming operation can be considered not just from its total acreage, but the acreage of different quality lands that comprise the operation. Lands with higher quality soils lend themselves to greater management and cropping flexibility and have the potential to provide a greater economic return per unit acre. For a given project, instead of relying upon a single acreage figure in the Project Size rating, the project is divided into three acreage groupings based upon the Land Capability Classification ratings that were previously determined in the Land Evaluation analysis. Under the Project Size rating, relatively fewer acres of high quality soils are required to achieve a maximum Project Size score. Alternatively, a maximum score on lesser quality soils could also be derived, provided there is a sufficiently large acreage present. Acreage figures utilized in scoring are the synthesis of interviews that were conducted statewide for growers of a broad range of crops. In the interviews growers were queried as to what acreage they felt would be necessary in order for a given parcel to be considered attractive for them to farm.

The USDA LCC continues to be the most widely available source of information on land quality. Project Size under this definition is readily measurable, and utilizes much of the same information needed to score a given project under the Land Evaluation component of the methodology. This approach also complements the LE determination, which, while addressing soil quality, does not account for the total acreage of soils of given qualities within a project.

This approach allows for an accounting of the significance of high quality agricultural land as well as lesser quality agricultural lands, which by virtue of their large area can be considered significant agricultural resources. In this way, no single acreage figure for a specific class of soils (e.g., soils defined as “prime”) is necessary.

2. Site Assessment - The Water Resources Availability Rating

The Water Resources Availability Rating is based upon identifying the various water sources that may supply a given property, and then determining whether different restrictions in supply are likely to take place in years that are characterized as being periods of drought and non-drought. **Site Assessment Worksheet 2. - Water Resources Availability Worksheet** (Table 4) is used to tabulate the score.

Step 1.
Identify the different water resource types that are used to supply the proposed project site (for example, irrigation district water, ground water, and riparian water are considered to be three different types of water resources). Where there is only one water source identified for the proposed project, skip to Step 4.

Step 2.
Divide the proposed project site into portions, with the boundaries of each portion being defined by the irrigation water source(s) supplying it. A site that is fully served by a single source of water will have a single portion, encompassing the entire site. A site that is fully served by two or more sources that are consistently merged together to serve a crop's needs would also have a single portion. (e.g., a portion of the proposed project may receive both irrigation district and groundwater). If the project site includes land that has no irrigation supply, consider this acreage as a separate portion as well. Enter the water resource portions of the project in **Column B** of Table 4, **Site Assessment Worksheet 2. - Water Resources Availability**.

[As an example, a hypothetical project site is determined to have four separate water supply portions:

Portion 1 is served by irrigation district water only;
Portion 2 is served by ground water only;
Portion 3 is served by *both* irrigation district water and ground water;
Portion 4 is not irrigated at all.**]**

Step 3.
Calculate the proportion of the total project area that is represented by each water resource portion, and enter these figures in **Column C** of **Site Assessment Worksheet 2. - Water Resources Availability**, verifying that the sum of the proportions equals 1.0.

Table 4. Site Assessment Worksheet 2. - Water Resources Availability

A	B	C	D	E
Project Portion	Water Source	Proportion of Project Area	Water Availability Score	Weighted Availability Score (C x D)
1				
2				
3				
4				
5				
6				
		(Must Sum to 1.0)	***Total Water Resource Score***	

Step 4.

For each water resource supply portion of the project site, determine whether irrigated and dryland agriculture is *feasible*, and if any *physical* or *economic restrictions* exist, during both *drought* and *non-drought* years. These italicized terms are defined below:

- A *physical restriction* is an occasional or regular interruption or reduction in a water supply, or a shortened irrigation season, that forces a change in agricultural practices -- such as planting a crop that uses less water, or leaving land fallow. (This could be from cutbacks in supply by irrigation and water districts, or by ground or surface water becoming depleted or unusable. Poor water quality can also result in a physical restriction -- for example by requiring the planting of salt-tolerant plants, or by effectively reducing the amount of available water.)

- An *economic restriction* is a rise in the cost of water to a level that forces a reduction in consumption. (This could be from surcharge increases from water suppliers as they pass along the cost of finding new water supplies, the extra cost of pumping more ground water to make up for losses in surface water supplies, or the extra energy costs of pumping the same amount of ground water from deeper within an aquifer.)

- Irrigated agricultural production is *feasible* when:

  1) There is an existing irrigation system on the project site that can serve the portion of the project identified in Step 2;

  2) *Physical* and/or *economic restrictions* are not severe enough to halt production; and

  3) It is possible to achieve a viable economic return on crops though irrigated production.

(A major question that should be considered is, if there is an irrigated crop that can be grown within the region, can it actually be grown on the project site? Depending upon the jurisdiction, some typical crops that have a large water demand may not be feasible to grow on the project site, while others that require less water are feasible. Information to aid in making this determination can be obtained from county agricultural commissioners, the UC Cooperative Extension, irrigation districts, and other sources.)

- *Dryland production* is *feasible* when rainfall is adequate to allow an economically viable return on a nonirrigated crop.

- A *drought year* is a year that lies within a defined drought period, as defined by the Department of Water Resources or by a local water agency. Many regions of the state are by their arid nature dependent upon imports of water to support irrigated agriculture. These regions shall not be considered under periods of drought unless a condition of drought is declared for the regions that typically would be providing water exports.

Step 5.
Each of the project's water resource supply portions identified in **Step 2** is scored separately. Water Resources Availability scoring is performed by identifying the appropriate condition that applies to each portion of the project, as identified in Table 5., **Water Resource Availability Scoring**. Using Table 5, identify the option that best describes the water resource availability for that portion and its corresponding water resource score. Option 1 defines the condition of no restrictions on water resource availability and is followed progressively with increasing restrictions to Option 14, the most severe condition, where neither irrigated nor dryland production is considered feasible. Enter each score into **Column D** of Table 4.

Step 6.
For each portion of the project site, determine the section's weighted score by multiplying the portion's score (**Column D**), by its proportion of the project area (**Column C**), and enter these scores in **Column E**, the weighted Water Availability Score. Sum the **Column E** scores to obtain the total Water Resource Availability Score, and enter this figure in **Line 4** of the **Final LESA Score Sheet** (Table 8).

Table 5. Water Resource Availability Scoring

Option	Non-Drought Years			Drought Years			WATER RESOURCE SCORE
	RESTRICTIONS			RESTRICTIONS			
	Irrigated Production Feasible?	Physical Restrictions ?	Economic Restrictions ?	Irrigated Production Feasible?	Physical Restrictions ?	Economic Restrictions ?	
1	YES	NO	NO	YES	NO	NO	100
2	YES	NO	NO	YES	NO	YES	95
3	YES	NO	YES	YES	NO	YES	90
4	YES	NO	NO	YES	YES	NO	85
5	YES	NO	NO	YES	YES	YES	80
6	YES	YES	NO	YES	YES	NO	75
7	YES	YES	YES	YES	YES	YES	65
8	YES	NO	NO	NO	-- --	-- --	50
9	YES	NO	YES	NO	-- --	-- --	45
10	YES	YES	NO	NO	-- --	-- --	35
11	YES	YES	YES	NO	-- --	-- --	30
12	Irrigated production not feasible, but rainfall adequate for dryland production in both drought and non-drought years						25
13	Irrigated production not feasible, but rainfall adequate for dryland production in non-drought years (but not in drought years)						20
14	Neither irrigated nor dryland production feasible						0

Explanation of the Water Resource Availability Rating

The Water Resource Availability factor in the California Agricultural LESA Model was developed in cooperation with Nichols-Berman, a consulting firm under contract with the Department of Conservation. A thorough discussion of the development of this rating is presented by Nichols-Berman in a report to the Department entitled, *Statewide LESA Methodologies Report - Project Size and Water Resource Availability Factors* (3). During the development of this factor it became apparent that certain conditions unique to California would need to be represented in this system.

First, it was decided to classify water reliability based upon the *effects* on agricultural production (such as being forced to change to lower-value crops, putting in groundwater pumps, or cutting back on the acreage farmed) rather than the actual *type* of limitation (such as a limitation on the quantity, frequency, or duration of water delivery). LESA systems have traditionally focused on the latter. However, it was found that the many types of limitations are too varied in California to adequately represent in the LESA system. In the Statewide LESA system, these effects are referred to as *restrictions*.

Second, the factor had to include an interrelation with cost. The historical shortages and unreliability of California water use has led to the establishment of various interconnected and dual systems. Probably more than any other state, reliability is related with cost -- a more reliable water supply can sometimes be obtained, but at a greater cost. Therefore, *restrictions* were classified into two major categories -- *physical* and *economic*. These are separated because, generally, a physical restriction is more severe than an economic restriction and this should be reflected in the LESA system.

Third, the factor had to include the effects of the drought cycle in California. During the drought of 1987 to 1992, many agricultural areas of the state experienced water shortages. The impact of these shortages resulted in a number of different actions. Some areas were able to avoid the worst effects of the drought simply by implementing water conservation measures. Other areas were able to obtain additional water supplies, such as by securing water transfers or simply pumping more groundwater, but at an increase in the overall price of water. Other options included shifting crops, replanting to higher value crops to offset the increase in water prices, or leaving land fallow. A project site that experiences restrictions during a drought year should not be scored as high as a similar project site that does not.

The easiest way to make determinations of irrigation feasibility and the potential restrictions of water sources is to investigate the cropping history of the project site. For instance, was the water supply to the project site reduced by the local irrigation district during the last drought? If the site has a ground water supply, do area ground water levels sometimes drop to levels that force markedly higher energy costs to pump the water?

If the history of the project site is unavailable (including when the site has recently installed an irrigation system), look at the history of the general area. However, remember that the project site may have different conditions than the rest of the region. For instance, the project site could have an older water right than others in the region. Although certain areas of the state had severe restrictions on water deliveries during the last drought, some parcels within these areas had very secure deliveries due to more senior water rights. If this was the case in the region of the project site, check the date of water right and compare it with parcels that received their total allotment during the last drought. The local irrigation district should have information on water deliveries.

The scoring of water resource availability for a project site should not just reflect the adequacies of water supply in the past -- it should be a *prediction* of how the water system will perform in the future. For instance, a local jurisdiction might find that the allocation of flows to stream and river systems has been recently increased for environmental reasons, which will decrease the future available surface water supply. In this case, the past history of the site is not an adequate representation of future water supply and water system performance.

3. Site Assessment - The Surrounding Agricultural Land Rating

Determination of the surrounding agricultural land use rating is based upon the identification of a project's "Zone of Influence" (ZOI), which is defined as that land near a given project, both directly adjoining and within a defined distance away, that is likely to influence, and be influenced by, the agricultural land use of the subject project site. The determination of the ZOI is described below, and is illustrated with an example in Figure 1.

Defining a Project's "Zone of Influence"

Step 1.
Locate the proposed project on an appropriate map and outline the area and dimensions of the proposed project site.

Step 2.
Determine the smallest rectangle that will completely contain the project site (Rectangle A).

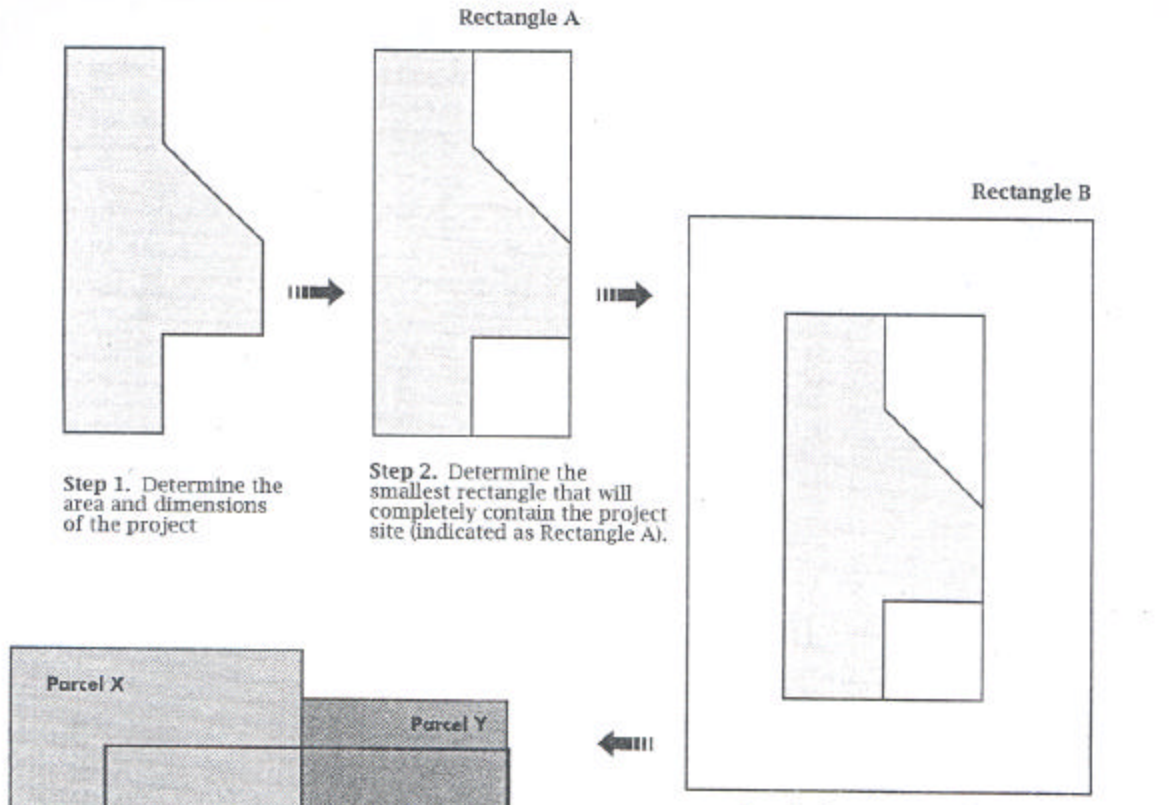
Step 3.
Create a second rectangle (Rectangle B) that extends 0.25 mile (1320 feet) beyond Rectangle A on all sides.

Step 4.
Identify all parcels that are within or are intersected by Rectangle B.

Step 5.
Define the project site's "zone of influence" as the entire area of all parcels identified in Step 4, less the area of the proposed project from Step 1.

[In the illustration provided in Figure 1, Parcels W, X, and Y extend beyond Rectangle B and are therefore included in their entirety in defining the project site's Zone of Influence.**]**

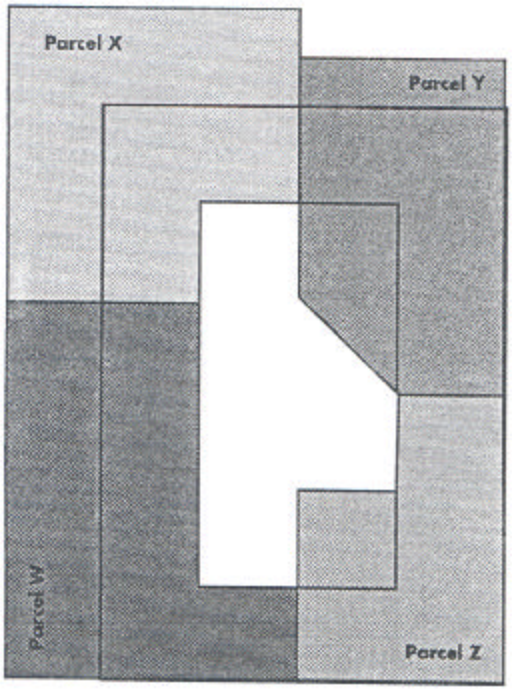
Figure 1: Defining a Project's Zone of Influence



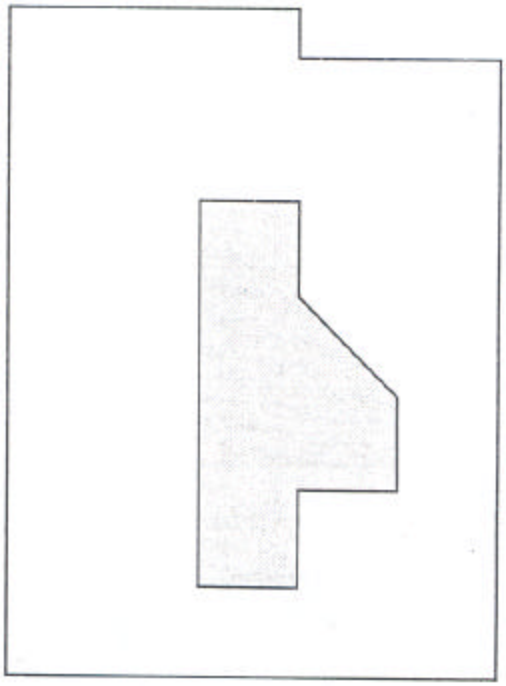
Step 1. Determine the area and dimensions of the project

Step 2. Determine the smallest rectangle that will completely contain the project site (indicated as Rectangle A).

Step 3. Create a second rectangle (Rectangle B) that extends 0.25 mile (1320 feet) beyond Rectangle A on all sides.



Step 4. Identify all parcels that are within or are intersected by Rectangle B.



Step 5. Define the project's "zone of influence" as the entire area of all parcels identified in Step 4, less the area of the proposed project from Step 1.

In this example, parcels W, X, and Y extend beyond Rectangle B and are therefore included in the their entirety in defining the project's zone of influence.

Measuring Surrounding Agricultural Land

Step 1.
Calculate the percentage of the project's Zone of Influence that is currently producing agricultural crops. **[**This figure can be determined using information from the Department of Conservation's Important Farmland Map Series, the Department of Water Resources' Land Use Map Series, locally derived maps, or direct site inspection. For agricultural land that is currently fallowed, a determination must be made concerning whether the land has been fallowed as part of a rotational sequence during normal agricultural operations, or because the land has become formally "committed" to a nonagricultural use. Land that has become formally committed, whether fallow or not, should not generally be included in determining the proportion of the Zone of Influence that is agricultural land. For further information on the definition of Committed Land, refer to the following Explanation of the Surrounding Agricultural Land Rating.**]**

Step 2.
Based on the percentage of agricultural land in the ZOI determined in Step 1, assign a Surrounding Agricultural Land score to the project according to Table 6, and enter this score in **Line 5** of the **Final LESA Scoresheet** (Table 8) .

Table 6. Surrounding Agricultural Land Rating

Percent of Project's Zone of Influence in Agricultural Use	Surrounding Agricultural Land Score
90 - 100%	100 Points
80 - 89	90
75 - 79	80
70 - 74	70
65 - 69	60
60 - 64	50
55 - 59	40
50 - 54	30
45 - 49	20
40 - 44	10
40 <	0

Explanation of the Surrounding Agricultural Land Rating

The Surrounding Agricultural Land Rating is designed to provide a measurement of the level of agricultural land use for lands in close proximity to a subject project. The California Agricultural LESA Model rates the potential significance of the conversion of an agricultural parcel that has a large proportion of surrounding land in agricultural production more highly than one that has a relatively small percentage of surrounding land in agricultural production. The definition of a "Zone of Influence" that accounts for surrounding lands up to a minimum of one quarter mile from the project boundary is the result of several iterations during model development for assessing an area that will generally be a representative sample of surrounding land use. In a simple example, a single one quarter mile square project (160 acres) would have a Zone of Influence that is a minimum of eight times greater (1280 acres) that the parcel itself.

Land within a Zone of Influence that is observed to be fallow will require a case by case determination of whether this land should be considered agricultural land. The Department of Conservation's Important Farmland Maps may be of assistance in making this determination. In addition, land currently in agricultural production may be designated as being "committed" to future nonagricultural development. The Department of Conservation's Farmland Mapping and Monitoring Program has a land use designation of Land Committed to Nonagricultural Use, and is defined as "land that is permanently committed by local elected officials to nonagricultural development by virtue of decisions which cannot be reversed simply by a majority vote of a city council or county board of supervisors. The "committed" land must be so designated in an adopted local general plan, and must also meet the requirements of either (a) or (b) below:

(a). It must have received one of the following final discretionary approvals:

1. Tentative subdivision map (approved per the Subdivision Map Act);
2. Tentative or final parcel map (approved per the Subdivision Map Act);
3. Recorded development agreement (per Government Code §65864);
4. Other decisions by a local government which are analogous to items #1-3 above and which exhibit an element of permanence. Zoning by itself does <u>not</u> qualify as a permanent commitment.

<u>Or</u>

(b) It must be the subject of one of the final fiscal commitments to finance the capital improvements specifically required for future development of the land in question as shown below:

1. Recorded Resolution of Intent to form a district and levy an assessment;
2. Payment of assessment;
3. Sale of bonds;
4. Binding contract, secured by bonds, guaranteeing installation of infrastructure;
5. Other fiscal commitments which are analogous to items #1-4 above and exhibit an element of permanence."

Lead agencies are encouraged to identify Land Committed to Nonagricultural Use within a project's ZOI and make the determination whether this land, while still in agricultural production, be considered nonagricultural land for the purposes of the calculation performed here.

4. Site Assessment - The Surrounding Protected Resource Land Rating

The Surrounding Protected Resource Land Rating is essentially an extension of the Surrounding Agricultural Land Rating, and is scored in a similar manner. Protected resource lands are those lands with long term use restrictions that are compatible with or supportive of agricultural uses of land. Included among them are the following:

- Williamson Act contracted lands
- Publicly owned lands maintained as park, forest, or watershed resources
- Lands with agricultural, wildlife habitat, open space, or other natural resource easements that restrict the conversion of such land to urban or industrial uses.

Instructions for the Surrounding Protected Resource Land Rating

Step 1.
Utilizing the same "Zone of Influence" (ZOI) area calculated for a project under the Surrounding Agricultural Land Rating, calculate the percentage of the ZOI that is Protected Resource Land, as defined above.

Step 2.
Assign a Surrounding Protected Resource Land score to the project according to Table 7, and enter this score on **Line 6** of the **Final LESA Scoresheet** (Table 8).

Table 7. Surrounding Protected Resource Land Rating

Percent of Project's Zone of Influence Defined as Protected	Surrounding Protected Resource Land Score
90 - 100%	100 Points
80 - 89	90
75 - 79	80
70 - 74	70
65 - 69	60
60 - 64	50
55 - 59	40
50 - 54	30
45 - 49	20
40 - 44	10
40 <	0

Section III. Weighting of Factors and Final LESA Scoring

The California LESA Model is weighted so that 50 percent of the total LESA score of a given project is derived from the Land Evaluation factors, and 50 percent from the Site Assessment factors. Individual factor weights are listed below, with the sum of the factor weights required to equal 100 percent.

Land Evaluation Factors

Land Capability Classification	25%
Storie Index Rating	25%
Land Evaluation Subtotal	**50%**

Site Assessment Factors

Project Size	15%
Water Resource Availability	15%
Surrounding Agricultural Lands	15%
Surrounding Protected Resource Lands	5%
Site Assessment Subtotal	**50%**
Total LESA Factor Weighting	**100%**

Each factor is measured separately (each on 100 point scale) and entered in the appropriate line in **Column B** of the **Final LESA Scoresheet** (Table 8). Each factor's score is then multiplied by its respective factor weight, resulting in a weighted factor score in **Column D** as indicated in Table 8. The weighted factor scores are summed, yielding a Total LESA Score (100 points maximum) for a given project, which is entered in **Line 7** of **Column D**.

Table 8. Final LESA Scoresheet

A	B		C		D
Factor Name	Factor Rating (0-100 points)	X	Factor Weighting (Total = 1.00)	=	Weighted Factor Rating
<u>Land Evaluation</u>					
1. Land Capability Classification	<Line 1>_____	X	0.25	=	_____
2. Storie Index Rating	<Line 2>_____	X	0.25	=	_____
<u>Site Assessment</u>					
1. Project Size	<Line 3>_____	X	0.15	=	_____
2. Water Resource Availability	<Line 4>_____	X	0.15	=	_____
3. Surrounding Agricultural Lands	<Line 5>_____	X	0.15	=	_____
4. Protected Resource Lands	<Line 6>_____	X	0.05	=	_____
			Total LESA Score (sum of weighted factor ratings)		<Line 7>_____

Section IV. California Agricultural LESA Scoring Thresholds - Making Determinations of Significance Under CEQA

A single LESA score is generated for a given project after all of the individual Land Evaluation and Site Assessment factors have been scored and weighted as detailed in Sections 2 and 3. Just as with the scoring of individual factors that comprise the California Agricultural LESA Model, final project scoring is based on a scale of 100 points, with a given project being capable of deriving a maximum of 50 points from the Land Evaluation factors and 50 points from the Site Assessment factors.

The California Agricultural LESA Model is designed to make determinations of the potential significance of a project's conversion of agricultural lands during the Initial Study phase of the CEQA review process. Scoring thresholds are based upon both the total LESA score as well as the component LE and SA subscores. In this manner the scoring thresholds are dependent upon the attainment of a minimum score for the LE and SA subscores so that a single threshold is not the result of heavily skewed subscores (i.e., a site with a very high LE score, but a very low SA score, or vice versa). Table 9 presents the California Agricultural LESA scoring thresholds.

Table 9. California LESA Model Scoring Thresholds

Total LESA Score	Scoring Decision
0 to 39 Points	Not Considered Significant
40 to 59 Points	Considered Significant only if LE and SA subscores are each greater than or equal to 20 points
60 to 79 Points	Considered Significant unless either LE or SA subscore is less than 20 points
80 to 100 Points	Considered Significant

Bibliography

1. *Conserving the Wealth of the Land - A Plan for Soil Conservation*, Department of Conservation. 1987.

2. *The Impacts of Farmland Conversion in California*. Prepared by Jones and Stokes, Associates, Inc., for the California Department of Conservation. 1991.

3. *Statewide LESA Methodologies Report - Project Size and Water Resource Availability Factors*. Prepared by Nichols - Berman, for the Department of Conservation. 1995.

4. *LESA Guidelines for Local Jurisdictions - Project Size and Water Resource Availability Factors*. Prepared by Nichols - Berman, for the Department of Conservation. 1995.

5. Office of the Federal Register National Archives and Records Administration. The Farmland Protection and Policy Act, part 658. Code of Federal Regulations - Agriculture, Parts 400 to 699. 1990.

6. Pease, J and R. Coughlin. Land Evaluation and Site Assessment: *A Guidebook for Rating Agricultural Lands, Second Edition*; prepared for the USDA Natural Resources Conservation Service; Soil and Water Conservation Society. 1996.

7. Pease, J., et al. *State and Local LESA Systems: Status and Evaluation*; In: Steiner, F., J. Pease, and R. Coughlin, eds. *A Decade with LESA: The Evolution of Land Evaluation and Site Assessment*. Soil and Water Conservation Society. 1994.

8. Steiner, F., J. Pease, and R. Coughlin, eds. *A Decade with LESA: The Evolution of Land Evaluation and Site Assessment*. Soil and Water Conservation Society. 1994.

APPENDIX H

Stockdale Integrated Banking Project –
Potential Impacts of Groundwater Level Changes on Abandoned Oil Wells

Draft Technical Memorandum

To: Mr. Dan Bartel
Rosedale-Rio Bravo Water Storage District

From: Thomas Harder, P.G., CH.G.
Thomas Harder & Co.

Date: 11-Apr-14

Re: Stockdale Integrated Banking Project – Potential Impacts of Groundwater Level Changes on Abandoned Oil Wells

This Technical Memorandum (TM) summarizes a review of potential impacts of proposed artificial recharge and recovery operations at the Stockdale Integrated Banking Project (the Project) on existing or abandoned oil wells on the Stockdale East portion of the Project (see Figure 1). Oil well data was obtained from the California Department of Oil, Gas, and Geothermal Resources.[1] No known oil wells are present on the Stockdale West portion of the Project. There are a total of nine known oil wells within the Stockdale East portion of the Project (see Figure 1). Of the nine wells, five are active, two are plugged, one is idle, and one is an active injection well (see Table 1). Of the two plugged oil wells, one has a cement plug between 959 and 1,005 feet below ground surface (ft bgs) and the other has two plugs between 1,694 and 1,926 ft bgs and 6 and 40 ft bgs. The typical construction of the oil wells in the area includes an upper casing and outer cement seal from the ground surface to approximately 500 ft bgs.

Maximum predicted groundwater level drawdown and mounding associated with the Project will not significantly impact active or abandoned oil wells. Well construction records for the nine known wells in the Project area indicate that all are constructed with an upper casing and outer cement seal that extend to a minimum of 495 ft bgs (see Table 1). Historical groundwater fluctuations have occurred in the upper approximate 290 ft bgs, which is well above the bottom of the shallowest oil well upper seal depth[2]. Project pumping is predicted to add a maximum of

[1] California Department of Oil, Gas, and Geothermal Resources. http://maps.conservation.ca.gov/doggr/index.html

[2] Thomas Harder & Co., 2013. Draft Proposed Stockdale Integrated Banking Project – Analysis of Potential Groundwater Level Changes from Recharge and Recovery at the Stockdale West and Stockdale East Facilities. Prepared for Rosedale-Rio Bravo Water Storage District and Irvine Ranch Water District. Dated 31-Oct-13.

approximately 20 ft of drawdown during low groundwater periods; however the cumulative drawdown would not reach 495 ft bgs. Accordingly, the additional drawdown is not predicted to significantly change the existing hydraulic connection of the oil wells with the aquifer system.

Summary of Oil Well Construction
Stockdale East Banking Project

API Number	Upper Casing Diameter (inches)	Upper Casing and Outer Cement Seal (ft bgs[1])	Depth of Hole (ft bgs)	Type and Status	Upper Abandonment Plug(s) (ft bgs)	Year of Upper Seal
2918593	10 3/4	0 - 550	9,935	Active Oil Well	NA[2]	NA
2918597	10 3/4	0 - 495	8,735	Active Oil Well	NA	NA
2918594	10 3/4	0 - 536	9,950	Active Oil Well	NA	NA
2900941	9 5/8	0 - 560	10,000	Active Oil Well	NA	NA
2918592	10 3/4	0 - 532	12,673	Active Oil Well	NA	NA
2918595	10 3/4	0 - 549	10,000	Idle Oil Well	NA	NA
2900120	10 3/4	0 - 515	10,240	Active Injection Well	NA	NA
2918555	11 3/4	0 - 1,003	9,000	Plugged Oil Well	959 - 1,005	1936
2918596	10 3/4	0 - 500	10,120	Plugged Oil Well	6 - 40 1,694 - 1,926	1973

Notes:

[1] ft bgs = feet below ground surface

[2] NA = not applicable

Rosedale-Rio Bravo Water Storage District
Irvine Ranch Water District

11-Apr-14

Stockdale Integrated Banking Project - Potential Impacts of Groundwater Level Changes on Abandoned Oil Wells

NAD 83 State Plane CA Zone 5

Map Features

- Active Oil Well
- Idle Oil Well
- Active Injection Well
- Plugged Oil Well
- Groundwater Well
- Stockdale East Property
- Strand Ranch Project

Note: Oil well data from the California Department of Oil, Gas, and Geothermal Resources at http://maps.conservation.ca.gov/doggr/index.html

Only wells within the Stockdale East property shown.

DRAFT

Oil Wells within Stockdale East

Figure 1

Thomas Harder & Co.
Groundwater Consulting