

RECLAMATION

Managing Water in the West

Environmental Assessment

Refuge Level 2 and Incremental Level 4 Water Exchange with San Luis and Del Puerto Water Districts

EA Number 15-21-MP

U.S. Department of the Interior
Bureau of Reclamation
Mid Pacific Region
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Mission Statements

The mission of the Department of the Interior is to protect and manage the Nation's natural resources and cultural heritage; provide scientific and other information about those resources; and honor its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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List of Acronyms and Abbreviations

AF	Acre-feet
B	Boron
CEQ	Council of Environmental Quality
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
Delta	Sacramento-San Joaquin Delta
Districts	San Luis and Del Puerto Water Districts
EA	Environmental Assessment
FONSI	Finding of No Significant Impact
GGs	Giant garter snake
GWD	Grassland Water District
GRCD	Grassland Resource Conservation District
IL4	Incremental Level 4 refuge water supply
ITA	Indian Trust Assets
L2	Level 2 refuge water supply
L4	Level 4 refuge water supply
mg/L	Milligrams per liter
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NWR	National Wildlife Refuges
PEIS	Programmatic Environmental Impact Statement
Reclamation	Bureau of Reclamation
Se	Selenium
SHPO	State Historic Preservation Officer
TDS	Total Dissolved Solids
ug/L	Micrograms per liter
USFWS	U.S. Fish and Wildlife Service

1 Introduction

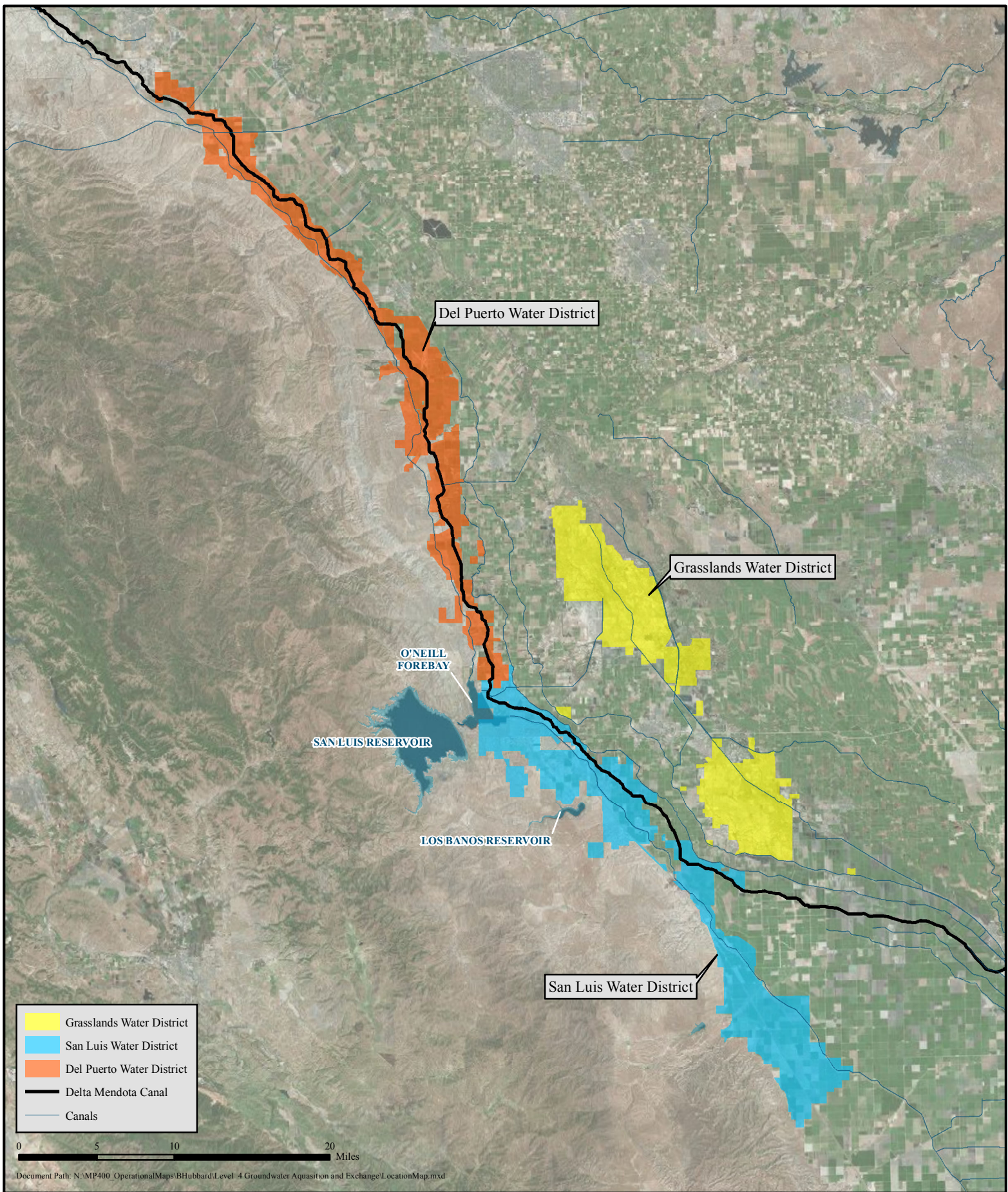
This Environmental Assessment (EA) has been prepared by the Bureau of Reclamation (Reclamation) to evaluate and disclose any potential environmental impacts associated with Reclamation's exchange of up to 4,000 acre-feet (AF) of groundwater for up to 2,000 AF of Level 2 (L2) water with the San Luis and Del Puerto Water Districts (Districts) (Proposed Action). This water exchange is authorized under Section 3406(d)(2) and 3406(b)(3) of the Central Valley Project Improvement Act (CVPIA).

A Report on Refuge Water Supply Investigations (Reclamation 1989) describes water needs and delivery requirements for National Wildlife Refuges (NWR), State Wildlife Management Areas, and the Grassland Resource Conservation District (GRCD). The GRCD, several of the State Wildlife Management Areas, and portions of the NWR comprise the Grasslands Ecological Area (GEA) in the Central Valley of California. In this report, the average annual historical water supplies were termed L2, and the supplies needed for optimum habitat management were termed "Level 4" (L4). Section 3406(d)(1) of the CVPIA requires the Secretary of the Interior to provide firm delivery of L2 water supplies to certain wildlife refuges in the Central Valley of California. Section 3406(d)(2) of the CVPIA further directs the Secretary to provide additional water supplies to meet Incremental L4 (IL4) needs through the acquisition of water from willing providers. Section 3406(d)(1) directs the Secretary to endeavor to diversify sources of supply.

This EA focuses on the potential impacts of exchanging up to 4,000 AF of groundwater developed by the Districts and delivered to the GRCD for up to 2,000 AF of L2 water made available to the Districts between August 2015 and February 29, 2016 to meet L2 and IL4 refuge water needs.

The GRCD is comprised of lands that are authorized to receive CVPIA refuge water supplies. The Grassland Water District (GWD) manages and delivers water to private wetlands within the GRCD. The GRCD's area contains approximately 75,000 acres of privately owned wetlands located north, east and south of the City of Los Banos in Merced County, California (Figure 1). The GEA area that also includes another 15,000 acres of wetlands owned by the State of California and the United States.

The Proposed Action would provide wetland water supplies within the GRCD and agricultural supplies within the Districts. A similar action was proposed and implemented last water year to help offset water needs during the ongoing drought.



Refuge Level 2 Exchange with San Luis and Del Puerto Water Districts
Water District Boundaries

FIGURE 1

1.1 Need for the Proposal

Reclamation is responsible for providing L2 and IL4 water to 19 designated federal, state, and privately owned/managed wetlands and wildlife areas (refuges), including the GRCD. L2 water supplies are primarily provided from Central Valley Project (CVP) supplies, while IL4 supplies are provided from other sources. The Proposed Action is needed to provide L2 and IL4 water supplies to the GRCD wetlands to provide habitat for migratory waterfowl during this period of extreme water shortage south of the Delta that limits available L2 and IL4 supplies for the GRCD.

1.2 Resources Analyzed in Detail

This EA will analyze the affected environment of the Proposed Action and No Action Alternative in order to determine the potential impacts and cumulative effects to the following environmental resources:

- Surface Water Resources
- Groundwater Resources, Geologic Resources and Water Quality
- Biological Resources

Impacts to the following resources were considered and found to be minor or absent. Brief explanations for their elimination from further considerations are provided below:

- Indian Sacred Sites: The Proposed Action is not on federal lands, and will neither affect nor prohibit access to and ceremonial use of Indian sacred sites.
- Indian Trust Assets: There are no Indian reservations, rancherias, or allotments in the Project area. The Proposed Action does not have the potential to affect Indian Trust Assets.
- Environmental Justice: No significant changes in agricultural communities or practices would result from the Proposed Action. Accordingly, the Proposed Action would not have disproportionately negative impacts on low-income or minority individuals or populations.
- Cultural Resources: The Proposed Action involves the acquisition of water from existing facilities with no new ground disturbance, modifications to facilities, or other potential impacts to cultural resources. Pursuant to the regulations at 36 CFR Part 800.3(a)(1), the Proposed Action has no potential to cause effects on historic properties and will result in no impacts to cultural resources. As such, Reclamation has no further obligations under Section 106 of the National Historic Preservation Act (NHPA).

2 Proposed Action & Alternatives

2.1 No Action Alternative

The No Action Alternative would consist of Reclamation not approving the exchange of L2 water supplies from the GWD to the Districts. The proposed 4,000 AF of groundwater to be developed as part of this Proposed Action would not be delivered to the GRCD and refuges this year. The Districts would not receive L2 water supplies (equivalent to 50% of the 4,000 AF delivered to GRCD) delivered by Reclamation to help meet agricultural water needs.

2.2 Proposed Action/Project Description

The Districts propose to fund the costs associated with the delivery of groundwater supplies from private wells located in the vicinity of Los Banos, near the GWD (up to 4,000 AF) in exchange for refuge L2 water supply (up to 2,000 AF). The developed groundwater would discharge directly into the GWD's Santa Fe Canal and San Luis Canal conveyance system and be delivered to the GRCD's private wetlands to meet a component of its L2 and IL4 water supply demands. The GWD will oversee and coordinate the delivery of groundwater supplies to the GRCD.

2.3 Well Locations

The location of the Districts' wells and the wetlands within the GRCD that will receive the groundwater are shown in Figure 2. The approximate GPS coordinates for the wells are:

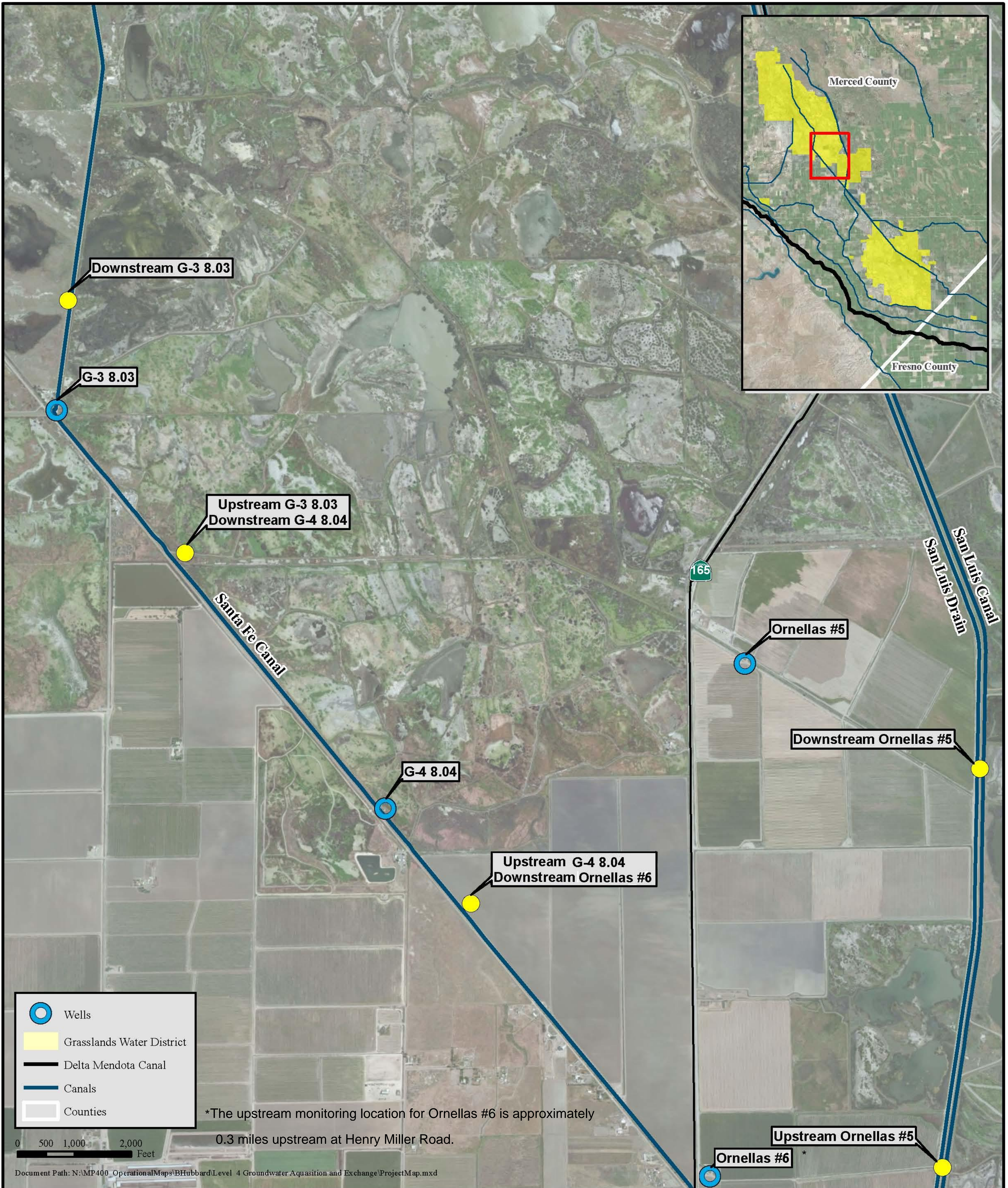
Well 8.03 (G-3) = Latitude: 37.1435; Longitude: 120.8723.

Well 8.04 (G-4) = Latitude: 37.1238; Longitude: 120.8533

Well Ornellas (OR)-5 = Latitude: 37.1306; Longitude: 120.8314

Well Ornellas (OR)-6 = Latitude: 37.1035; Longitude: 120.8332

Once the GWD begins receiving scheduled deliveries of its L2 water supply in the late summer/fall of 2015, it is proposed that the Districts fund the cost to develop and deliver up to 4,000 AF of groundwater in exchange for up to 2,000 AF of L2 water during the GRCD L2 delivery period this water year (2015/16). For every 2 AF of groundwater delivered to the GWD for the GRCD, the Districts will receive 1 AF of L2 water. The L2 exchange water will be made available to the Districts each month following the delivery of groundwater to the GWD. This 2:1 exchange will result in a net refuge water supply benefit of up to 2,000 AF of IL4 water at no cost to Reclamation and up to 2,000 AF of new water supply for the Districts.



Refuge Level 2 Exchange with San Luis and Del Puerto Water Districts
 Well Sites Utilized in Grassland Water District

FIGURE 2

The Districts will enter into an agreement with Reclamation for the exchange of water. The Districts, in cooperation with the GWD, will be responsible for all water quality monitoring associated with the development of these groundwater supplies and insure that all water quality monitoring criteria and standards identified in the Monitoring and Mitigation Plan (Appendix A) are met. The GWD will provide monthly volumetric totals to the Districts and Reclamation.

The GWD is planning to start taking delivery of its L2 water in the late summer or fall of 2015 and plans to receive L2 water deliveries through the end of the water year (February 29, 2016). When the exchange agreement with Reclamation is executed and the GRCD starts taking delivery of its scheduled L2 water the exchange can be initiated. It is anticipated the wells will be operated for exchange purposes through the end of February 2016.

The Districts would be responsible for well operations and maintenance and for coordinating the pumping of groundwater into the GWD's facilities at times when the GWD requests such water. The GWD would have access to the wells in order to test water quality and monitor flow. If water quality monitoring results do not meet the criteria set forth in the Monitoring and Mitigation Plan, GWD would notify Reclamation and the exchange would cease until water quality criteria can be met.

Table 1 – Well Location, Depth, Production Rate and Water Quality

Well	Well Depth (feet)	Output (cu.- ft./sec)	TDS (mg/L)	Boron (mg/L)	Selenium (ug/L)
G-3 8.03	300	3.4	1,050	1.1	ND
G-4 8.04	310	3.6	341	0.66	ND
OR-5	450	4.5	1,680	3.3	ND
OR-6	225	3.5	810	pending	pending

2.4 Monitoring

Project monitoring would include metering of the flows received from each of the wells. Flows would be metered at each wellhead and at the well discharge pipes into the GWD conveyance canals.

To minimize any potential for surface water quality degradation associated with the utilization of groundwater in the GRCD to supplement IL4 water supply, water quality monitoring would consist of both surface and groundwater quality monitoring. Surface water quality monitoring would consist of both continuous and instantaneous sampling. Monitoring will include sampling from upstream locations to determine the base flow constituent concentrations, a downstream location, and at each wellhead. If threshold surface water quality objectives are exceeded at any time, corrective actions would be implemented within 24 hours, including blending groundwater with surface water supplies and reducing or ceasing well pumping operations until water quality objectives can be met.

In an effort to minimize any potential significant impact on groundwater aquifers associated with the development of groundwater as part of this Proposed Action, groundwater levels will be measured prior to beginning pumping operations for the Proposed Action using an electronic water level meter referenced to a GPS coordinate and elevation at each wellhead. Subsequently, well drawdown related to the operation of each well will be measured in the middle of the proposed pumping period, and at the end of the pumping period prior to well shutdown. Groundwater recovery will be measured approximately 24 hours after pump shutoff. Groundwater level data will be recorded and included in the GWD's annual reports to Reclamation for review. If the mid-pumping period groundwater level data indicates a significant decline in groundwater levels in the vicinity of the proposed wells, different from the levels of decline typically seen during operation of the GWD's IL4 Pilot Project wells, and if any such decline is not directly attributable to a cause other than the operation of the proposed wells during the Proposed Action pumping period, the Districts will modify or terminate pumping to avoid any significant adverse groundwater impacts. The Districts will immediately respond to any complaints received from third parties, and will take all measures necessary to avoid third party well impacts.

To minimize any potential impacts on land subsidence associated with cumulative groundwater pumping in the Delta-Mendota groundwater subbasin, the Districts will collaborate with and participate in the established land subsidence monitoring programs of the San Luis and Delta-Mendota Water Authority and Central California Irrigation District. The Proposed Action wells are 300 to 450 feet deep and pump groundwater from above the Corcoran Clay, which has not been associated with land subsidence. Significant land subsidence has not been documented within the GRCD.

More detailed monitoring information is located in the Project Monitoring and Mitigation Plan (Appendix A).

3 Affected Environment & Environmental Consequences

The Districts are located on the west side of San Joaquin, Merced and Fresno counties and the GWD/GRCD are located in western Merced County (Figure 1). The wells are all located in Merced County, outside the boundaries of the Districts. The counties are bounded by the Sierra Nevada Mountains to the east and the Pacific coastal range to the west. The project region is characterized by flat valley lowland wetlands and agricultural lands, with a climate that is cool and moist in the winter and hot and dry in the summer.

The GRCD contains most of the 51,530 acre GWD. The GWD is a legal entity that was established under section 34000 of the California Water Code to receive and distribute CVP water. The GWD delivers CVP water to the wetland areas within its boundaries. The GWD contains approximately 165 separate ownerships, most of which are duck clubs. Perpetual easements have been purchased by the USFWS to help preserve wetland-dependent migratory bird habitat on approximately 31,000 acres serviced by the GWD. These easements authorize the USFWS to restrict land uses that would diminish wetland habitat values (Grassland Water District 2015). The GRCD has primarily been managed as a seasonally flooded wetland to provide for the habitat needs of migratory waterfowl and associated species. The GRCD provides habitat for a variety of bird species, including ducks, geese, shorebirds, coots, and wading birds. Black-necked stilts, sandpipers, dunlins, and dowitchers are the dominant shorebird species.

3.1 Surface Water Resources

3.1.1 Affected Environment

CVPIA L2 and IL4 water is provided by Reclamation Contract 01-WC-20-1756 signed January 19, 2001, to provide firm water supplies to refuge lands south of the Delta. The total amount of CVPIA Level 4 water allocated to GWD for delivery to the GRCD is 180,000 acre-feet per year (125,000 L2 and 55,000 IL 4). CVP water is delivered to the GRCD and other south-of-Delta refuges from water pumped from the Delta by the Jones Pumping Plant and conveyed via the Delta Mendota Canal to the Mendota Pool in the San Joaquin River. A series of canals and ditches convey CVP water through the GRCD.

The GWD also delivers IL4 water supplies to the GRCD from a variety of sources. Historically, Reclamation has made annual purchases of up to 49,000 AF of IL4 water from the San Joaquin River Exchange Contractors (SJREC). Reclamation also acquires up to 10,000 AF of groundwater from wells that are within or in close proximity to the GRCD as part of an ongoing pilot project.

Within GWD and GCRD, a large network of surface water conveyance facilities exists to provide water to private and public lands. The Santa Fe Canal would be utilized as the conveyance facility to deliver groundwater from three wells (G-3 8.03, G-4 8.04 and

Ornellas #6) and Well G-5 8.05 will discharge into the Standard Ditch and the groundwater will be delivered to meet demands off the Standard Ditch and San Luis Canal. Total flow in the Santa Fe Canal will range from approximately 40 cubic-feet per second (cfs) to 450 cfs during the Proposed Action. Total flow in the San Luis Canal will range from approximately 40 cubic-feet per second (cfs) to 100 cfs during the Proposed Action.

The current water year is an historic drought year. As a result of the drought and regulations controlling Project operations, the amount of water available for L2 deliveries in the GRCD is likely to be below 75%. No surface water acquisitions of IL4 water are proposed. The quantity of water available to wetland habitats in the GRCD will be unusually low, creating the risk of waterfowl crowding and disease outbreaks.

3.1.2 Environmental Consequences

No Action

Under the No Action Alternative, Reclamation would not approve the exchange of surface water for groundwater from the privately owned wells. Groundwater would not be delivered via the Santa Fe Canal and San Luis Canal to the GRCD to help meet 2015-2016 IL4 refuge water needs. The total available water supply for the GRCD refuge this year would remain substantially below L4 water needs, and the risk of avian disease outbreaks would remain extremely high. Also, the Districts would not receive up to 2,000 AF of water for agricultural use, which is needed to help offset the Districts' zero allocation of CVP water.

Proposed Action

The Proposed Action would result in no substantial change or impact to CVP operations, or to Delta pumping by the CVP. The acquired water would be delivered to the GRCD via the GWD's existing conveyance facilities, namely Santa Fe and San Luis Canals. Implementation of the Monitoring and Mitigation Plan (Appendix A) would ensure that conveyance of water under this Proposed Action would not adversely impact existing water supplies or water quality. The Proposed Action would not adversely impact water conveyance facilities or activities within the GWD/GRCD. Instead, the additional deliveries through the Proposed Action would have the beneficial effect of helping to meet L4 refuge needs during a period when there are severe physical constraints on providing the full L2 and IL4 supplies, as well as to provide a supplemental supply for agricultural use in the Districts during a year of zero CVP water allocation.

Cumulative Impacts

No significant adverse impacts to surface water resources would result from implementation of the Proposed Action, therefore, the Proposed Action would not contribute to cumulative impacts to the resource.

3.2 Groundwater Resources, Geologic Resources, & Water Quality

3.2.1 Affected Environment

The wells are located in the Delta-Mendota Subbasin of the San Joaquin Groundwater Basin. Groundwater in the Delta-Mendota Subbasin typically occurs in three water-bearing zones. These include the lower zone, which contains confined fresh water in the lower section of the Tulare Formation, an upper zone which contains confined, semi-confined, and unconfined water in the upper section of the Tulare Formation and younger deposits, and a shallow zone which contains unconfined water within about 25 feet of the land surface (Davis 1959). The estimated specific yield of this subbasin is 11.8 percent (based on DWR San Joaquin District internal data and Davis 1959). (DWR Bulletin 118)

Groundwater flow was historically northwestward parallel to the San Joaquin River (Hotchkiss 1971). Recent data (DWR 2000) show flow to the north and eastward, toward the San Joaquin River. Based on current and historical groundwater elevation maps, groundwater barriers do not appear to exist in the subbasin. (DWR Bulletin 118)

Changes in groundwater levels are based on annual water level measurements by DWR and cooperators. Water level changes were evaluated by Quarter Township and computed through a custom DWR computer program using geostatistics (kriging). On average, the subbasin water level has increased by 2.2 feet from 1970 through 2000. The period from 1970 through 1985 showed a general increase, topping out in 1985 at 7.5 feet above the 1970 water level. The nine-year period from 1985 to 1994 saw general declines in groundwater levels, reaching back down to the 1970 groundwater level in 1994. Groundwater levels rose in 1995 to about 2.2 feet above the 1970 groundwater level. Water levels fluctuated around this value until 2000. (DWR Bulletin 118)

The groundwater in this subbasin is characterized by mixed sulfate to bicarbonate types in the northern and central portion with areas of sodium chloride and sodium sulfate waters in the central and southern portion. Total Dissolved Solids (TDS) values range from 400 to 1,600 mg/L in the northern portion of the subbasin and from 730 to 6,000 mg/L in the southern portion of the subbasin (Hotchkiss 1971). The Department of Health Services (DHS), which monitors Title 22 water quality standards, reports TDS values in 44 public supply wells to range from 210 to 1,750 mg/L, with an average value of 770 mg/L. A typical range of water quality in wells is 700-1,000 mg/L. (DWR Bulletin 118)

Groundwater supplies in the region are declining due to a long-term overdraft condition caused by over-pumping. For the past four years, GWD has collected data on water quality, annual well drawdown, and annual post-pumping water recovery levels for all wells within its groundwater program. Based on a review of this data, no adverse effects have been observed.

Land subsidence due to groundwater withdrawal is triggered by decreases in pore pressure in a confined aquifer system containing clay layers (typically montmorillonite

or kaolinite clay). The decrease in pore pressure increases the effective stress on the aquifer skeleton. If this effective stress exceeds the maximum stress to which the aquifer skeleton has been subjected in the past, the clay layers can undergo permanent compaction (USGS 2009).

Elastic subsidence occurs in response to seasonal changes in pore pressure within the aquifer system. Elastic subsidence is a characteristic of any confined aquifer system and does not result in permanent compaction (USGS 2009).

The groundwater quality within the Delta-Mendota Sub-basin varies with location and depth both within the upper aquifer above the Corcoran Clay and in the lower aquifer beneath the Corcoran Clay. Groundwater quality in the GRCD is typically characterized by TDS, selenium (Se), and boron. Based on several years of data under the existing IL4 Groundwater Acquisition Pilot Project, the primary constituents of concern for refuge water supplies are TDS, boron and selenium. The water quality of the receiving waterway is also a relevant factor. Under the Proposed Action's Monitoring and Mitigation Plan (Appendix A), groundwater entering the GWD's conveyance system may require dilution or mixing with surface water to ensure that concentrations of TDS do not increase by more than 200 milligrams per Liter (mg/L) downstream of the groundwater discharge, and Se concentrations do not exceed 2 ug/L in the conveyance facility. Blending with better quality water supply ensures compliance with Total Maximum Daily Load regulations and refuge water quality requirements. Concentrations of all constituents are also monitored at each wellhead. Groundwater that exceeds 5.0 ug/L of Se at the wellhead will not be utilized, regardless of the resulting blended concentration in the GWD's conveyance system.

3.2.2 Environmental Consequences

No Action

Under the No Action Alternative, Reclamation would not approve the exchange of surface water for groundwater from the wells. Groundwater would not be delivered via the Santa Fe Canal and Standard Ditch/San Luis Canal to the GRCD to help meet IL4 refuge water needs. The total available water supply for the GRCD refuge this year would remain below L4 water needs, and the risk of avian disease outbreaks would remain extremely high. Also, the Districts would not receive up to 2,000 AF of water for agricultural use during a period when its allocation from the CVP is zero. The volume of groundwater pumping within the vicinity of the private wells would remain unchanged.

Proposed Action

Groundwater would be produced from existing electrically powered wells. Groundwater would be pumped in an amount up to 4,000 AF beginning in late summer/fall through the end of February 2016. This period coincides with the highest demand period for refuge water supply and would ensure that blending with surface water would be maximized. The actual amount of groundwater produced would be dependent on the productivity of the wells and other factors, such as water quality and groundwater drawdown. All groundwater produced by the production wells would be discharged into the Santa Fe

Canal and the San Luis Canal (via the Standard Ditch) and mixed with other waters in the Canal, including surface water for dilution (if necessary). All groundwater produced during the project would be used for refuge management purposes within the GRCD. Pumping would only occur if monitoring data indicates that water quality and water levels are suitable for refuge use and water quality standards provided in the Monitoring and Mitigation Plan are being met.

The GWD will monitor groundwater depths at the wells. The GWD will measure groundwater depths 24 hours prior to pumping, and then measure again at approximately the midpoint of the pumping period and at the end of the pumping period. The GWD will then take another measure of groundwater depth approximately 24 hours after the pumping period ends to evaluate the recovery time of the groundwater. The three major constituents of concern are salinity (measured in TDS), boron and selenium. The GWD will closely monitor water quality at the wells during the Proposed Action. If the water quality data indicates that the use of a well(s) may adversely impact water quality, the mitigation measures described below (and incorporated into the Proposed Action, as well as the Monitoring and Mitigation Plan) will be implemented. If groundwater is found to contain constituent concentrations above the Central Valley Regional Water Quality Control Board's (CVRWQCB) surface water thresholds, groundwater will be blended with higher quality surface water upon discharge into flowing conveyance channels, effectively reducing concentrations below the thresholds outlined below, or the well production rate will be reduced or curtailed for purposes of the Proposed Action until flow conditions improve and water quality objectives can be achieved. The mitigation measures below will ensure that the groundwater supply developed during this Proposed Action will not significantly adversely impact surface water quality. If the monitoring indicates that threshold values are exceeded, mitigation measures will be implemented within 24 hours of identifying an exceedance.

Water Quality Mitigation Measures

The GWD will not accept water from any of the subject wells if the water exceeds the following values:

- Maximum of 5.0 µg/L for selenium (wellhead)

The GWD will modify or cease wellhead operation until flow conditions improve if any of the following downstream water quality thresholds are exceeded:

- Maximum increase of 200 mg/L TDS upstream to downstream of the well discharge
- Maximum of 2.0 µg/L for selenium

In the event that the water from any of the wells increase TDS levels in the GWD's conveyance downstream from a wellhead discharge by more than 200 mg/L, the well production rate will be reduced or operation curtailed for Proposed Action purposes until flow conditions improve and downstream water quality objectives can be achieved.

Monitoring of downstream locations will determine the combined flow and chemistry

of the blended water. The sites shall be adequate distance from the well discharges to assure proper blending for grab sample collection. All water quality data will be kept at the GWD's office. As soon as practical (generally within 7 days of the GWD's receipt of information from the water quality testing laboratory), the GWD will ensure that Reclamation receives electronic copies of the complete data reports submitted by the laboratory. The GWD will also provide a monthly water quality summary report, including volumetric data on wellhead production, within 60 days of sample collection. All data will also be recorded and included in the GWD's annual reports to Reclamation for review. Water quality data and reports will also be provided to the CVRWQCB at least once per year. The GWD will provide Reclamation with a monitoring report at the end of the Proposed Action. The report will describe, among other things, the results of the GWD's monitoring efforts (See Appendix A, Monitoring Program).

Cumulative Effects

When added to past, present, and future foreseeable action, the Proposed Action could contribute to a minor increase in groundwater production in the general vicinity during the project pumping period. Private wells in and near the project area would continue to utilize groundwater during the proposed action, however, local groundwater use would be low since the period of the Proposed Action is during the non-irrigation season. Pumping would not affect the lower aquifer system below the Corcoran Clay, and it is not anticipated that pumping during the Proposed Action would substantially impact the upper aquifer system. No groundwater level impacts were observed during the previous year's project.

The incremental impact of pumping over a two year period up to 4,000 acre-feet under the Proposed Action when added to the scheduled pumping that will occur as part of the other 2015 IL4 Groundwater Acquisition Project and the GWD IL4 Pilot Project would contribute a minimal increase to groundwater pumping from above the Corcoran Clay during the Proposed Action. This cumulative impact would not be substantial because groundwater levels would be monitored for drawdown to avoid adverse impacts. Monitoring data has indicated pumping of up to 10,000 acre-feet from the Pilot Project wells since 2008 as well as the other groundwater acquisition projects has not had a negative impact on groundwater elevations (GWD 2011; GWD 2012; Reclamation 2014).

The project groundwater production period would not occur during the irrigation season and would be unlikely to occur simultaneous with significant pumping of any local agricultural wells. This additional amount of pumping would not substantially impact groundwater resources.

Water quality analyses were conducted on samples taken from the project wells. A summary of the analysis reports is shown in Table 1. Water quality monitoring and mitigation measures associated with the Proposed Action, the IL4 Pilot Project, and the 2015 GWD IL4 Groundwater Acquisition Project will ensure that cumulative impacts to water quality within the GRCD are less than significant. Under the Proposed Action, impacts to water quality would be insignificant and continual monitoring would occur

along with any follow-on actions under the Project Monitoring and Mitigation Plan. Therefore, the Proposed Action would not significantly contribute to cumulative impacts to water quality.

3.3 Biological Resources

3.3.1 Affected Environment

Wetlands

The GRCD's wetlands are maintained primarily by surface water, and water conveyance infrastructure is in place to service each of the numerous ponds or cells. Low lift pumps are located along the GWD's conveyance canals to facilitate water conveyance to the higher elevations of the GRCD. In the GRCD, wetland habitats consist of seasonally flooded marshes, including moist soil impoundments, and permanent ponds and summer water. Vernal pools or seasonal wetlands occur within the GRCD.

Seasonally flooded marsh is by far the most numerous and diverse of the wetland habitat types on the state and federal refuges and private wetland areas of the San Joaquin River Basin. Seasonal wetlands are inundated fields or ponds that are managed primarily to grow seed and to produce invertebrates for migratory waterfowl, shorebirds and other wetland-dependent wildlife. These wetlands are usually flooded from October through March, and are dry for the rest of the year except for summer irrigation.

The diversity of seasonal wetlands is the product of a variety of water depths that result in an array of vegetative species that, in combination, provide habitat for the greatest number of wildlife species throughout the course of a year. Through the fall and winter, seasonally flooded marshes are used by large concentrations of waterfowl and smaller numbers of egrets, herons, ibis, and grebes, to name a few. In addition, a full complement of raptors takes advantage of the water bird prey base. Water is removed in the spring, so large concentrations of shorebirds use the shallow depth and exposed mudflats on their northern migration. Seed-producing plants germinate and grow to maturity on the moist pond bottoms during the springs and early summer. Wetland flooding in the fall makes this food available to early migrant waterfowl and other waterfowl.

Moist soil impoundments are similar to seasonally flooded marshes, except that they are irrigated in the summer to improve production of water grass, sprangletop, and swamp timothy, the primary food species for waterfowl. Moist soil impoundments are typically irrigated during the summer to bolster plant growth and to enhance seed production. During irrigation periods, these units are often used by locally nesting colonial water birds (egrets, herons). Once flooded, these units provide an abundant food source for waterfowl. In addition, a number of wading bird species frequent them

throughout the year. Semi-permanent and permanent wetlands provide wetland habitat for year-round and summer resident species. Semi-permanent wetlands typically are flooded for a minimum of 8 or months of the year, while permanent wetlands remain flooded throughout the year. Characterized by both emergent and submergent aquatic plants, semi-permanent and permanent wetlands provide brood and molting areas for waterfowl, secure roosting and nesting sites for wading birds and other over-water nesters, and provide feeding areas for species like cormorants and pelicans.

Riparian

There are no riparian habitats that occur in the Proposed Action area or near the water delivery areas.

Developed/Disturbed

Developed and disturbed areas include major roads, highways, and buildings and structures within more urban areas, but also facilities and access roads which are located throughout the GRCD/GWD area near each well location.

Wildlife

The following list of federally listed, proposed and candidate species potentially occurring in the GRCD/GWD area was obtained on June 9, 2015 by accessing the USFWS Database. The list also includes State listed, proposed and candidate species potentially occurring in the GRCD/GWD area obtained by accessing the California Department of Fish and Game California Natural Diversity Database/Rarefind (CNDDB/Rarefind) on June 9, 2015.

The species list below is for the area near the project wells in the vicinity of Los Banos. This area is included in the San Luis Ranch and Los Banos 7 ½ minute U.S. Geological Survey quadrangles. Not all of the species listed below are within the project area, but were included on the list provided by USFWS for the area.

Invertebrates

Branchinecta conservatio

Conservancy fairy shrimp (FE)

Critical habitat, Conservancy fairy shrimp (X)

Branchinecta longiantenna

Critical habitat, longhorn fairy shrimp (X)

Longhorn fairy shrimp (FE)

Branchinecta lynchi

Critical habitat, vernal pool fairy shrimp (X)

Vernal pool fairy shrimp (FT)

Desmocerus californicus dimorphus

Valley elderberry longhorn beetle (FT)

Lepidurus packardii

Critical Habitat, vernal pool tadpole shrimp (X)
Vernal pool tadpole shrimp (FE)

Fish

Hypomesus transpacificus
Delta smelt (FT) (ST)

Oncorhynchus mykiss
Central Valley steelhead (FT) (NMFS)

Amphibians

Ambystoma californiense
California tiger salamander, central population (FT)

Rana aurora draytonii
California red-legged frog (FT)

Reptiles

Gambelia (=Crotaphytus) *sila*
Blunt-nosed leopard lizard (FE) (SE)

Thamnophis gigas
Giant garter snake (FT) (ST)

Mammals

Dipodomys nitratooides exillis
Fresno kangaroo rat (FE)

Vulpes macrotis mutica
San Joaquin kit fox (FE) (ST)

Plants

Chamaesyce hooveri
Critical habitat, Hoover's spurge (X)
Hoover's spurge (FT)

FE: Listed as Endangered under the ESA.
FT: Listed as Threatened under the ESA.
X: Critical Habitat designated for this species
SE: Listed as Endangered under the CESA
ST: Listed as Threatened under the CESA

Of all the wildlife and all the listed species identified in the area, due to proximity to the well pumping and the nature of the proposed action, only a few species were identified to be assessed further in this EA. Affected environment information is provided below for these few species.

Giant Garter Snake

The giant garter snake (GGS) inhabits wetland habitats and vegetated permanent water channels in scattered subpopulations in the Central Valley from Butte County in the north to Fresno County in the south. It is believed extirpated from the vicinity of Buena Vista and Tulare Lakes south of Fresno County. GGS are present within the GRCD/GWD area, primarily within the Volta Wildlife Area.

GGS are found in close proximity to permanent or semi-permanent water with vegetated perimeters. GGS is an aquatic feeder specializing in capturing small fish and frogs in or under water. GGS spends the winter in upland retreats above the high water level. As discussed further below, the Proposed Action is not expected to impact this species and its habitat.

Aleutian Canada Goose, Bald Eagle, Peregrine Falcon, and Yellow-Billed Cuckoo

The Aleutian Canada goose, Bald Eagle, Peregrine Falcon, and Yellow-Billed Cuckoo are occasional visitors to the project area. The project would provide additional loafing, foraging, and roosting sites within the GRCD for Aleutian Canada Geese, Bald Eagles, and Peregrine Falcons. There is no suitable riparian habitat within GRCD for the Yellow-billed Cuckoo.

Swainson's Hawk

Swainson's hawk is the most migratory of all North American buteos. It breeds and summers in the arid and semiarid regions of western North America and winters on the pampas of Argentina. The breeding population in California has declined by an estimated 90 percent. In 1979, the breeding population in California was estimated at 375 pairs. This species arrives in the vicinity of the North Grasslands Wildlife Area and Los Banos Wildlife Area in late February to early March each year, and nests within an intermix of trees. Trees commonly used for nesting in this area are cottonwoods, willows, and valley oaks. The principal foods in the Central Valley are meadow mice and small birds. Use of the area by Swainson's hawk coincides with the time of year when most of the seasonal wetlands have been allowed to dry for their annual growing season. Likewise, this species migrates south prior to the seasonal wetlands being flooded for wintering wildlife populations arriving in the fall.

Based upon the CNDDDB records and observations by CDFW staff, no known Swainson's hawk nest sites occur within the GRCD Comprehensive Management Plan (CMP) project area. Nest sites do occur along the San Joaquin River, which is not located in the Proposed Action area. Swainson's hawks are featured species in the GRCD CMP and would benefit from the Proposed Action. Grassland foraging areas and potential nest trees would not be disturbed.

San Joaquin Kit Fox

The San Joaquin kit fox, a State-listed threatened and Federally-listed endangered species, is a small nocturnal canid which now occurs in scattered populations from Contra Costa County south to Kern County. Historically, this species occupied extensive areas of semiarid lands in the San Joaquin Valley. Flat topography in valley bottoms with valley sink scrub, valley saltbush scrub, interior coast range saltbush scrub, nonnative grassland and alkali playa plain communities (described in Holland, 1986) are the typical habitat, but substantial populations have always inhabited the surrounding low foothills where slopes do not exceed 40 degrees (O'Farrell 1983). Agricultural, industrial, and urban developments have caused rapidly increasing rates of habitat loss.

The San Joaquin kit fox is an obligate year-round burrow dweller which feeds largely upon lagomorphs and kangaroo rats (but would utilize whatever prey is locally abundant). Numerous dens are excavated and inhabited in the course of a year and individuals may cover great distances while foraging and/or dispersing.

The San Joaquin kit fox is considered here because of the potential foraging habitat (irrigated pasture and seasonally flooded grassland and alkali sink scrub). No known active or potential kit fox dens have been observed within the project area.

3.3.2 Environmental Consequences

No Action

Conditions would remain the same as existing conditions if no action were taken. There would be no new impacts to wildlife, including threatened and endangered species, their critical habitat, or general habitat types.

Proposed Action

Under the Proposed Action, no adverse impacts to wildlife or listed species in the project vicinity are anticipated. The addition of up to 4,000 AF of groundwater supplies to the GWD's conveyance system during the proposed period of operation is actually expected to provide some minor benefits to wildlife and listed species since without the pumping, water deliveries to the GCRD during this period are likely to be less. Overall, the Proposed Action would provide a benefit to waterfowl, shorebirds, and raptors, as the water would be used for refuge management to sustain wetland habitats during a period of extreme shortage in available refuge water supply.

The pumping and conveyance of groundwater within the GRCD would not affect aquatic species or their habitat. Habitat for Delta smelt, Chinook salmon (spring and winter run), Central Valley steelhead, or green sturgeon would not be affected because no construction or flow modifications are proposed on natural waterways, and the groundwater pumping locations are not adjacent to streams. There would be no effect to federally listed fish species mentioned above and there would be no modification of critical habitat for the species as a result of the Proposed Action.

Indirect impacts are not expected to occur from water quality affecting the prey base of the GGS because water entering the Santa Fe Canal, Standard Ditch or the San Luis Canal and delivered to habitat areas will be blended to meet water quality objectives protective of the prey base. Groundwater from existing production wells would be pumped into the Santa Fe Canal and San Luis Canal and delivered throughout the GRCD. This would occur during a period when the GGS is not active, and no effects to GGS are anticipated.

Water is expected to be of suitable quality for other aquatic species that use wetland areas within the GRCD. Water quality would be continually tested during the project period at the outflow of the production wells and immediately upstream and downstream of the well locations. If water quality is determined to be of unsuitable quality, pumping into the GWD conveyance system would be modified or curtailed.

The Proposed Action will have no effect on any special status species. The Proposed Action would not change how water is managed. Also, with implementation of the Proposed Action, CVP operations would be consistent with existing operating and conveyance agreements. The Proposed Action is consistent with the actions covered by previous analyses and would not result in any changes from existing operations or conditions.

Cumulative Impacts

Implementation of the Proposed Action would not result in effects to biological resources, and therefore could not contribute to cumulative impacts.

4 Consultation and Coordination

4.1 Public Review Period

Reclamation intends to sign a Finding of No Significant Impact for this Project, and will make the EA available for seven days beginning August 26, 2015. All comments will be addressed in the FONSI. Additional analysis will be prepared if substantive comments identify impacts that were not previously analyzed or considered.

4.2 Agencies Consulted

Reclamation coordinated with the following agencies during preparation of the EA:

- San Luis Water District
- Del Puerto Water District
- Grassland Water District
- Grassland Resource Conservation District

5 References

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U.S. Geological Survey. 2013. Land Subsidence along the Delta-Mendota Canal in the Northern Part of the San Joaquin Valley, California, 2003–10.
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Appendix A

Monitoring and Mitigation Plan For San Luis and Del Puerto Water Districts' Exchange of Groundwater for Refuge Level 2 Water

WATER QUALITY MONITORING

In an effort to minimize ambient surface water quality degradation associated with the San Luis and Del Puerto Water Districts' (Districts) development and exchange of groundwater for refuge Level 2 water supplies, water quality monitoring will consist of both surface and groundwater quality monitoring. Additionally, this groundwater exchange will provide refuge Incremental Level 4 water supplies. The Districts, in collaboration with the Grassland Water District (GWD), will be responsible for implementing this Monitoring and Mitigation Plan (Plan).

Surface water quality monitoring will consist of both continuous and instantaneous sampling. Monitoring will include sampling from upstream locations to determine the base flow constituent concentrations, a downstream location, and at each wellhead. Continuous surface water quality monitoring will be accomplished in part through the GWD's Real-Time Water Quality Monitoring Network, characterizing electrical conductivity (EC), temperature, pH, and flow, which is subject to a rigorous quality assurance program plan to ensure that the data is accurate and representative of actual conditions. Additionally, flow meters at each of the wellheads will characterize individual wellhead production in cubic-feet per second and total flow in acre-feet. Data will be recorded and included in GWD's monthly reports to the Bureau of Reclamation (Reclamation) in conjunction with monthly meter readings. Instantaneous water quality monitoring will be accomplished through grab sample analysis of the ambient surface water quality upstream and downstream of the wellhead discharge as well as the groundwater quality at the wellhead. The upstream, downstream and wellhead water will be sampled and analyzed (EC, pH, and temperature) by the GWD on a weekly basis during the well operational period utilizing YSI 600XL multi-parametric SONDE water quality sensors, and recorded in a weekly log.

Grab samples will also be collected upstream of the wellhead discharge, downstream of the wellhead discharge (where the input of the delivered well water is mixed with the receiving water), and at each wellhead on a monthly basis and analyzed for selenium, boron, and Total Dissolved Solids (TDS) concentrations by a Reclamation approved laboratory. The Reclamation-approved lab used to analyze selenium will provide a maximum reporting limit (RL) of 0.4 micrograms per liter ($\mu\text{g/L}$). Boron analysis requires a maximum RL of 100 $\mu\text{g/L}$ and TDS a maximum RL of 10 milligrams per liter (mg/L).

If the water quality data indicates that the use of a well(s) may adversely impact water quality, the mitigation measures described later in this Plan (and incorporated into the

Proposed Action) will be implemented. If groundwater is found to contain constituent concentrations above the Central Valley Regional Water Quality Control Board's (CVRWQCB) surface water thresholds, groundwater will be blended with higher quality surface water upon discharge into flowing conveyance channels, effectively reducing concentrations below the thresholds outlined below, or the well production rate will be reduced or curtailed for purposes of the Proposed Action until flow conditions improve and water quality objectives can be achieved. The mitigation measures below will ensure that the groundwater supply developed during this Proposed Action will not significantly adversely impact surface water quality. If the monitoring indicates that threshold values are exceeded, mitigation measures will be implemented within 24 hours of identifying an exceedance.

Water Quality Threshold and Reporting Limits – Laboratory Analysis

Analyte	Water Quality Goal	Maximum RL (µg/L)
Boron (µg/L)	Monitor	100
TDS (mg/L)	<200 increase over background	10,000 (10 mg/L)
Selenium (µg/L)	Not to exceed 2 µg/L in conveyance/not to exceed 5µg/L at the wellhead	0.4

Water Quality Monitoring and Sampling Schedule

Location	Sample Frequency				
	EC	FLOW	SELENIUM	BORON	TDS
Upstream	Weekly	continuous	monthly	monthly	monthly
Wellhead	Weekly	continuous	monthly	monthly	monthly
Downstream	Weekly	continuous	monthly	monthly	monthly
Conveyance	Continuous	continuous	monthly	monthly	monthly

Water Quality Mitigation Measures

GWD will not accept water from any of the project wells if any of the wells exceed the following values:

- Maximum of 5.0 µg/L for selenium

The Districts and/or GWD will modify or cease wellhead operation until flow conditions improve if any of the following downstream water quality thresholds are exceeded:

- Maximum increase of 200 mg/L TDS upstream to downstream per well
- Maximum of 2.0 µg/L for selenium

In the event that the water from any of the wells increase TDS levels in GWD's conveyance downstream from a wellhead by more than 200 mg/L, the well production rate will be reduced or operation curtailed for Proposed Action purposes until flow conditions improve and downstream water quality objectives can be achieved.

GWD has quantified flow conditions required to meet downstream water quality objectives for each of the wells based on individual wellhead water quality sampling data. Accordingly, GWD will immediately modify or cease pumping if inadequate flow conditions are observed prior to receiving laboratory confirmation of an exceedance.

Each well, as it is operated for Proposed Action purposes, will be monitored for selenium, boron, TDS, EC and flow at its discharge point (this point must represent wellhead water quality) into GWD's conveyance channels. Flow will be measured by a flow meter capable of recording instantaneous flow in cubic-feet per second and total flow in acre-feet.

Monitoring of downstream locations will determine the combined flow and chemistry of the blended water. The sites shall be adequate distance from the well discharges to assure proper blending for grab sample collection. All water quality data will be kept at GWD's office. As soon as practical (generally within 7 days of GWD's receipt of information from the water quality testing laboratory), GWD will ensure that Reclamation receives electronic copies of the complete data reports submitted by the laboratory. GWD will also provide a monthly water quality summary report, including volumetric data on wellhead production, within 60 days of sample collection. All data will also be recorded and included in GWD's current annual reporting to Reclamation. Water quality data and reports will also be provided to the CVRWQCB at least once per year.

GROUNDWATER LEVEL MONITORING

In an effort to minimize any potential significant impact on groundwater aquifers associated with the development of groundwater as part of this Proposed Action, groundwater levels will be measured prior to pump operation for the Proposed Action using an electronic water level meter referenced to a GPS coordinate and elevation at each wellhead. Subsequently, well drawdown related to the operation of each well will be measured in the middle of the proposed pumping period, and at the end of the pumping period prior to well shutdown. Groundwater recovery will be measured approximately 24 hours after pump shutoff. Groundwater level data will be recorded and included in GWD's current annual reporting to Reclamation. If the mid-pumping period groundwater level data indicates a significant decline in groundwater levels in the vicinity of the proposed wells, different from the levels of decline typically seen during operation of GWD's IL4 Pilot Project wells, and if any such decline is not directly attributable to a cause other than the operation of the proposed wells during the Proposed Action pumping period, the Districts will modify or terminate pumping to avoid any significant adverse groundwater impacts. The Districts will immediately respond to any complaints received from third parties, and will take all measures necessary to avoid third party well impacts.

LAND SUBSIDENCE MONITORING

The San Luis and Delta-Mendota Water Authority (Authority) is the monitoring agency for the Delta-Mendota subbasin. The groundwater wells pump from the intermediate zone, above the Corcoran Clay. Although significant land subsidence has been measured within the Delta-Mendota subbasin, most of it has occurred south of the GWD and has been associated with pumping from the lower zone, beneath the Corcoran Clay. Because of this, the proposed actions groundwater pumping activities are not expected to contribute to potential land subsidence issues. The Authority and Central California Irrigation District maintain land subsidence monitoring programs. The Districts will review the results of those monitoring programs and collaborate with those agencies and to the extent practical mitigate problems associated with land subsidence attributable to implementation of the Proposed Action.