RECLAMATION

Managing Water in the West

Final Environmental Assessment

Firebaugh Canal Water District 5-Year Transfer Program

EA-18-025

U.S. Department of the Interior
Bureau of Reclamation
South-Central California Area Office

May 2019

Mission Statements

The mission of the Department of the Interior is to conserve and manage the Nation's natural resources and cultural heritage for the benefit and enjoyment of the American people, provide scientific and other information about natural resources and natural hazards to address societal challenges and create opportunities for the American people, and honor the Nation's trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities to help them prosper.

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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Section 1 Introduction

The Bureau of Reclamation (Reclamation) provided the public with an opportunity to comment on the Draft Finding of No Significant Impact (FONSI) and Draft Environmental Assessment (EA) between November 21, 2018 and December 21, 2018. Changes between this Final EA and the Draft EA, which are not minor editorial changes, are indicated by vertical lines in the left margin of this document.

1.1 Background

The San Joaquin River Exchange Contractors (Exchange Contractors), which include Central California Irrigation District, Firebaugh Canal Water District (Firebaugh), San Luis Canal Company and Columbia Canal Company hold historic senior water rights to water supplies in the San Joaquin River watershed. In exchange for the Central Valley Project's (CVP's) regulation and diversion of the San Joaquin River water at Friant Dam, the Bureau of Reclamation (Reclamation) agreed to provide water to the Exchange Contractors from the CVP's Sacramento-San Joaquin Delta supply.

In 2014, Reclamation approved a series of annual transfers over a 5-year period between Firebaugh, Pacheco Water District (Pacheco), Panoche Water District (Panoche), San Luis Water District (San Luis), and Westlands Water District (Westlands), hereafter referred to as the Transfer Recipient Districts. As the program is set to expire, Firebaugh has requested approval from Reclamation to continue the series of annual transfers over another five years. Reclamation analyzed the annual transfers in Environmental Assessment (EA)-14-001 (Reclamation 2014). Based on specific environmental commitments, Reclamation determined that the proposed transfers would not significantly affect the quality of the human environment and a Finding of No Significant Impact (FONSI) was issued in April 2014. EA/FONSI 14-001 is hereby incorporated by reference.

1.2 Need for the Proposed Action

The State of California has experienced unprecedented water management challenges due to severe drought in recent years. South of Delta CVP contractors, such as the Transfer Recipient Districts, experienced reduced water supply allocations from 2007 to 2017 due to hydrologic conditions and regulatory requirements. In 2018, based on hydrologic conditions, Reclamation declared an initial 20 percent allocation for South of Delta CVP agricultural contractors for the 2018 Contract Year[1] which increased to 50 percent in June. In 2019, South of Delta CVP contractors received an initial allocation of 35 percent which was recently increased to 65 percent. As a result, South of Delta water contractors have a need to find alternative sources of

[1] Contract Year is from March 1 through February 28/29 of the following year.

water to fulfill demands. The proposed transfers would allow Firebaugh and landowners in the Transfer Recipient Districts greater flexibility to manage limited water supplies (Figure 1).

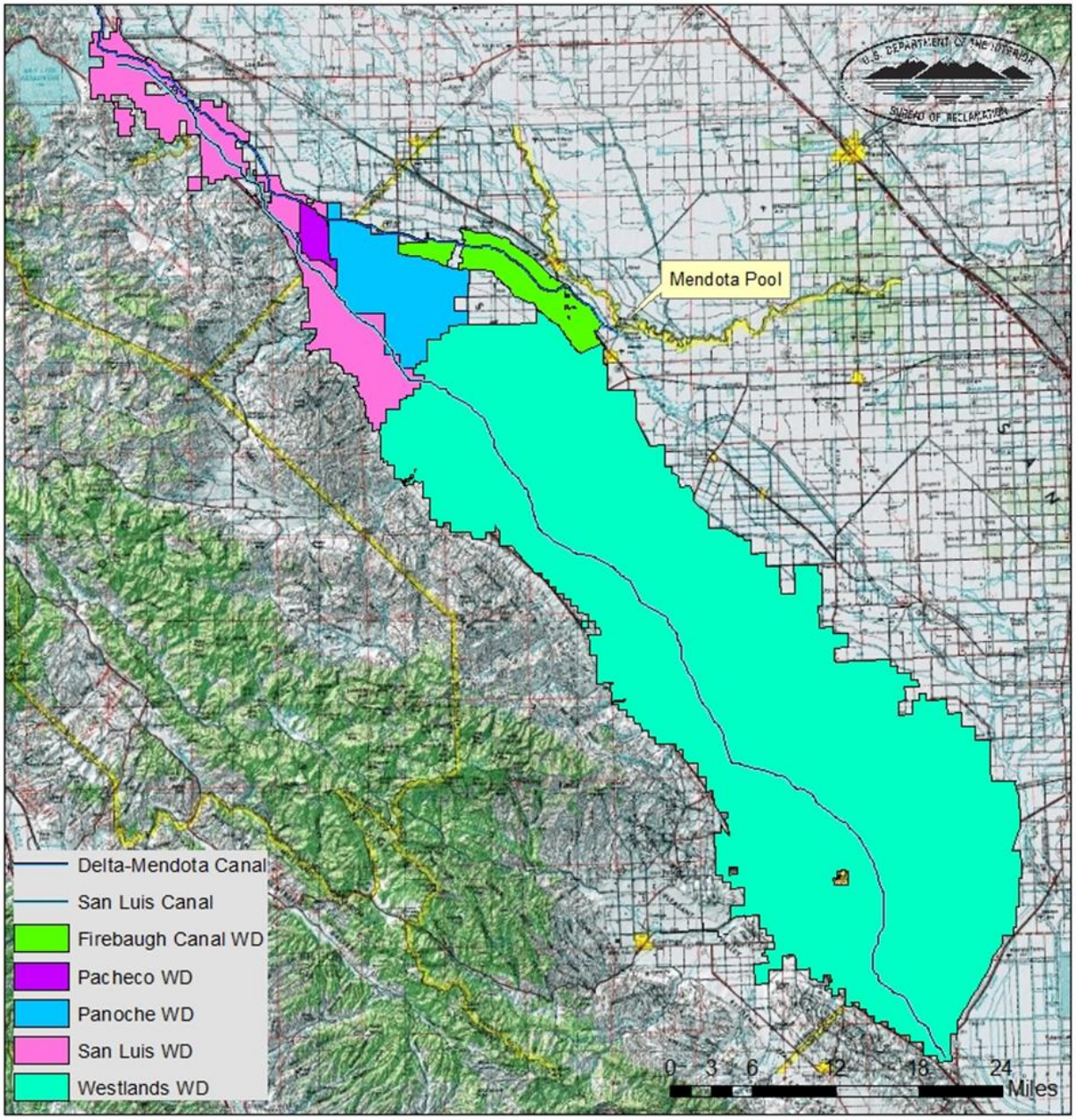

Figure 1 Proposed Action Area

Section 2 Alternatives Including the Proposed Action

This EA considers two possible actions: the No Action Alternative and the Proposed Action. The No Action Alternative reflects future conditions without the Proposed Action and serves as a basis of comparison for determining potential effects to the human environment.

2.1 No Action Alternative

Under the No Action Alternative, Reclamation would not approve a series of annual transfers over a five-year period (2019 through 2023) of up to 7,500 acre-feet per year (AFY) of Firebaugh's Exchange Contract CVP water supplies to the Transfer Recipient Districts. Reclamation would continue to deliver CVP water to Firebaugh and the Transfer Recipient Districts pursuant to their respective CVP water service contracts.

2.2 Proposed Action

Reclamation proposes to approve a series of annual transfers over a five-year period (calendar year 2019 through 2023) of up to 7,500 AFY of Firebaugh's Exchange Contract CVP water supplies to the Transfer Recipient Districts. The proposed transfers would occur from April through December of each year when water is transferred and would not exceed the maximum of 37,500 AF over the five-year period.

To make Firebaugh's CVP water supplies available for the transfers, Firebaugh landowners would pump up to 17 cubic feet per second (cfs) of groundwater (for a maximum of 36 AF/day) from three wells (Figure 1). The groundwater would be used to meet in-district demands, in lieu of taking surface water deliveries dedicated to Firebaugh under the Exchange Contract. Well specifications for the wells that would be used include:

- 5 cfs well estimated to pump up to 3,500 AF (well #2 also referred to as Hall Well)
- 3 cfs well estimated to pump up to 1,500 AF (well #3 also referred to as City Well)
- 9 cfs well estimated to pump up to 2,500 AF (well #5)

The pumped groundwater would be conveyed in Firebaugh's existing conveyance system, freeing up 7,500 AF of CVP water under the Exchange Contract to be delivered to the Transfer Recipient Districts via the Delta-Mendota Canal and the San Luis Canal. Groundwater from Well #2 and Well #3 would be directly discharged into Firebaugh's Intake Canal when there are existing demands and would not enter Mendota Pool. Groundwater from Well #5 would be directly discharged into Mendota Pool when there are demands, where it would then enter Firebaugh's Intake Canal for internal distribution to its landowners.

Figure 2 Firebaugh Canal Water District's Wells Proposed for Groundwater Pumping

2.2.1 Environmental Commitments

Reclamation, Firebaugh, and the Transfer Recipient Districts shall implement the following environmental protection measures to avoid environmental consequences associated with the Proposed Action (Table 1).

Table 1 Environmental Commitment and Resource Protection Measures

Resource	**Protection Measure**
Water Resources	Firebaugh and their landowners would follow the policy entitled "*Firebaugh Canal Water District Water Transfer Policy*." (Appendix A.)
Biological Resources	Groundwater from Well 5 would only be discharged into Mendota Pool when flow in Fresno Slough is to the south.
Biological Resources	Well water with Total Dissolved Solids (TDS) concentrations greater than 1,600 milligram per liter (mg/L) would not be pumped into the Mendota Pool. During the fall months, when there is reduced flow in the Mendota Pool and water quality at the Mendota Wildlife Area is most critical, well water with TDS higher than 1,200 mg/L TDS will not be pumped into Mendota Pool.
Biological Resources	Selenium in well water pumped into Mendota Pool would not exceed 2.0 micrograms per liter (µg/L).
Biological Resources	No native or untilled land (fallow for three consecutive years or more) may be cultivated with CVP water without additional environmental analysis and approval.
Biological Resources	As described in Appendix B and mentioned in Section 3.2.2, San Luis would not deliver CVP water to developments or other habitat conversions without evidence of Endangered Species Act compliance.
Various Resources	No new construction or modification of existing facilities may occur in order to

Resource	Protection Measure
	complete the Proposed Action.
Various Resources	The Proposed Action cannot alter the flow regime of natural waterways or natural watercourses such as rivers, streams, creeks, ponds, pools, wetlands, etc., so as to have a detrimental effect on fish or wildlife or their habitats.
Various Resources	The Proposed Action must comply with all applicable Federal, State and local laws, regulations, permits, guidelines and policies.
Various Resources	The Proposed Action would not increase or decrease water supplies that would result in development.

Environmental consequences for resource areas assume the measures specified would be fully implemented.

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Section 3 Affected Environment and Environmental Consequences

This section identifies the potentially affected environment and the environmental consequences involved with the Proposed Action and the No Action Alternative, in addition to environmental trends and conditions that currently exist.

3.1 Resources Eliminated from Further Analysis

Reclamation analyzed the affected environment and determined that the Proposed Action did not have the potential to cause direct, indirect, or cumulative adverse effects to the resources listed in Table 2.

Table 2 Resources Eliminated from Further Analysis

Resource	Reason Eliminated
Air Quality	Two of Firebaugh's wells have electric motors which do not produce emissions that impact air quality. The third well has a diesel engine; however, this well meets the specifications for compression engines as outlined in San Joaquin Valley Air Pollution Control District Rule 4702, Section 5.2.4 and would not exceed air quality thresholds.
Cultural Resources	The Proposed Action would facilitate the flow of water through existing facilities to existing users. As no construction or modification of facilities would be needed in order to complete the Proposed Action, Reclamation has determined that these activities have no potential to cause effects to historic properties pursuant to 36 CFR Part 800.3(a)(1). See Appendix C for Reclamation's determination.
Environmental Justice	The Proposed Action would not cause dislocation, changes in employment, or increase flood, drought, or disease nor would it disproportionately impact economically disadvantaged or minority populations.
Global Climate Change	The Proposed Action does not include construction of new facilities or modification to existing facilities. While pumping would be necessary to deliver CVP water, no additional electrical production beyond baseline conditions would occur. In addition, the generating power plant that produces electricity for the electric pumps operates under permits that are regulated for greenhouse gas emissions. As such, there would be no additional impacts to global climate change. Global climate change is expected to have some effect on the snow pack of the Sierra Nevada and the runoff regime. It is anticipated that climate change would result in more short-duration high-rainfall events and less snowpack runoff in the winter and early spring months by 2030, compared to recent historical conditions (Reclamation 2016, pg 16-26). However, the effects of this are long-term and are not expected to impact CVP operations within the five-year window of this action. Further, CVP water allocations are made dependent on hydrologic conditions and environmental requirements. Since Reclamation operations and allocations are flexible, any changes in hydrologic conditions due to global climate change would be addressed within Reclamation's operation flexibility.
Indian Sacred Sites	The Proposed Action would not limit access to ceremonial use of Indian Sacred Sites on federal lands by Indian religious practitioners or significantly adversely affect the physical integrity of such sacred sites. Therefore, there would be no impacts to Indian Sacred Sites as a result of the Proposed Action.
Indian Trust Assets	The Proposed Action would not impact Indian Trust Assets as there are none in the Proposed Action area.
Socioeconomics	The Proposed Action would have beneficial impacts on socioeconomic resources with the Transfer Recipient Districts as the transferred water would be used to help sustain existing crops and maintain farming within the districts. There would be no adverse

Resource	Reason Eliminated
	socioeconomic impacts within Firebaugh as water needs would still be met and agricultural practices would be unchanged.

3.2 Biological Resources

3.2.1 Affected Environment

An official list of federally listed threatened and endangered species and critical habitat that occur within the project area and/or may be affected as a result of the Proposed Action was obtained on August 28, 2018, by accessing the United States Fish and Wildlife Service (USFWS) database: https://ecos.fws.gov/ipac/. The list is summarized below (Table 3) and was generated for a polygon that encompassed the entire Proposed Action area. Reclamation further queried the California Department of Fish and Wildlife, California Natural Diversity Database (CNDDB) for records of protected species within 10 miles of the project location (CNDDB 2018). The Proposed Action area does not fall within any proposed or designated critical habitat.

Table 3 Federally Listed Threatened and Endangered Species

Species	Status[1]	Effects[2]	Potential to occur and summary basis for ESA determination [3]
Amphibians			
California red-legged frog (*Rana draytonii*)	T, X	NE	**Absent**: No longer occurs in this part of its historical range.
California tiger salamander (*Ambystoma californiense*)	T, X	NE	**Absent**: No vernal pools or other suitable seasonal wetlands present.
Birds			
Western Yellow-Billed Cuckoo (*Coccyzus americanus*)	T, PX	NE	**Absent**: Extensive cottonwood-willow riparian habitat lacking in the Proposed Action area.
Fish			
delta smelt (*Hypomesus transpacificus*)	T, X	NE	**Absent**: Impacts due to pumping in the Sacramento-San Joaquin Delta, which is where this species occurs and where critical habitat is designated have already been addressed by the long-term coordinated operations of the CVP and SWP.
Invertebrates			
vernal pool fairy shrimp (*Branchinecta lynchi*)	T, X	NE	**Absent**: No vernal pools present.
Mammals			
Fresno kangaroo rat (*Dipodomys nitratoides exilis*)	E, X	NE	**Absent**: Known from the Alkali Sink Ecological Reserve but doesn't occur on actively farmed land.
giant kangaroo rat (*Dipodomys ingens*)	E	NE	**Absent**: No longer occurs in this part of its historical range.
San Joaquin kit fox (*Vulpes macrotis mutica*)	E	NE	**Possible**: May use Proposed Action Area for foraging but not expected to den in actively farmed lands (Warrick et al. 2007).
Reptiles			
blunt-nosed leopard lizard (*Gambelia silus*)	E	NE	**Absent**: Does not occur on actively farmed land.
giant garter snake (*Thamnophis gigas*)	T	NE	**Present**: Known from the vicinity in low numbers.

1 Status = Status of federally protected species protected under the ESA.
E: Listed as Endangered
T: Listed as Threatened
X: Critical Habitat designated for this species.
PX: Critical Habitat proposed for this species.
2 Effects = ESA Effect determination

NE: No Effect anticipated from the Proposed Action to federally listed species or designated critical habitat.
3 Definition of Occurrence Indicators
Present: Species recorded in area and suitable habitat present.
Possible: Species recorded in area and habitat suboptimal.
Absent: Species not recorded in study area and suitable habitat absent.

The Action area consists of agricultural fields that provide some habitat values for a few species listed above, particularly the San Joaquin kit fox. However, there is routine disturbance due to on-going farming practices, and so even the San Joaquin kit fox would have very limited use of the area and would generally not be able to den there. It is possible that Western Burrowing Owls and Swainson's Hawks, protected by the Migratory Bird Treaty Act, may nest and forage in the area.

The giant garter snake can potentially be affected by low water quality, and in this portion of its range, the species is threatened with extirpation. Its status has been detailed in the biological opinion issued by the Service for the third use agreement for the Grassland Bypass Project (Service 2010). The biological opinion explains the risks that elevated selenium pose for the giant garter snake, and specifically states that snakes should not be exposed to water with selenium concentrations that exceed two parts per billion in order to avoid selenium toxicosis. Low quality groundwater would be an issue for the giant garter snake for any canal that serves as a water supply channel for Grasslands' wetlands. The only well involved in the Proposed Action that would discharge water into Mendota Pool is Well #5. A giant garter snake was found in the Mendota Pool vicinity (Mendota Wildlife Area) in 2008 (Hansen 2008). The giant garter snake, because of extensive losses of suitable natural wetlands, now relies on rice fields in parts of its range. In 2017, 101 acres of rice were grown in Firebaugh. No water was transferred that year. In 2018, the same 101 acres was planted with rice, and some water was transferred (J. Bryant, pers. comm.).

3.2.2 Environmental Consequences

No Action

Under the No Action Alternative, there would be no impacts to biological resources since conditions would remain the same as existing conditions.

Proposed Action

Most of the habitat types required by species protected by the Endangered Species Act do not occur in the Action area (see Table 3). The Proposed Action would not involve the conversion of any land fallowed and untilled for three or more years. In addition, the Proposed Action would not change the land use patterns of the cultivated or fallowed fields that do have some value to listed species or to birds protected by the Migratory Bird Treaty Act. Land within San Luis, which is considered by the USFWS and the California Department of Fish and Wildlife to be important for connecting kit fox populations to the south with those in the northern range, would be protected by the commitment made by the district (see Appendix B). Since no natural stream courses or additional surface water pumping would occur, there would be no effects on listed fish species. No critical habitat occurs within the area affected by the Proposed Action and so none of the primary constituent elements of any critical habitat would be affected.

The giant garter snake would be protected by the restrictions incorporated into the Proposed Action as outlined in Table 1. These restriction include the following: (1) well water from well #5 would only be pumped into Mendota Pool when flow in Fresno Slough is to the south, (2) well water with TDS concentrations greater than 1,600 mg/L would not be pumped into the Mendota Pool, (3) well water with TDS higher than 1,200 mg/L TDS would not be pumped into Mendota Pool during the fall months, when there is reduced flow in the Mendota Pool and water quality at the Mendota Wildlife Area is most critical, and (4) selenium in well water pumped into Mendota Pool would not exceed 2.0 µg/L. As described previously, and included in Appendix D, water quality data for all three wells complied with these requirements from 2014-2018. The Proposed Action is not expected to affect whether or not rice is grown in Firebaugh, or the acreage planted with rice. For example, rice cultivation occurred in 2017 when no water transfers occurred, and cultivation continued in 2018, when water transfers occurred.

The short duration of the water availability, the requirement that no native lands be converted without consultation with the Service, and the stringent requirements for transfers under applicable laws would preclude any impacts to wildlife, whether Federally listed or not.

Cumulative Impacts

As the Proposed Action is not expected to result in any direct or indirect impacts to biological resources, there would be no cumulative impacts.

3.3 Water Resources

3.3.1 Affected Environment

The affected environment is the same as was previously covered in EA 14-001 (Reclamation 2014) which has been incorporated by reference.

Groundwater in Firebaugh has generally not been pumped for direct irrigation use without first mixing with surface water supplies within Firebaugh's internal distribution system due to high salinity concentrations from a perched aquifer. Groundwater is regularly pumped as a way to draw down the perched aquifer in order to prevent impacts to existing crops (pers. communication Jeff Bryant). All of Firebaugh's wells, including those under the Proposed Action, pump between 180 to 240 feet below ground surface, well above the Corcoran Clay layer (Schmidt 2019).

Table 4 Transfer Water Pumped Since 2014 in Relation to SOD CVP Agricultural Allocations

Year	South of Delta CVP Agricultural Allocation (% of Contract Total)	Transfer Quantity Approved (AF)	Quantity Actually Pumped (AF)
2018	50%	7,500	1,977
2017	100%	7,500	0
2016	5%	7,500	4,183
2015	0%	7,500	4,017
2014	0%	7,500	4,610
Total			**14,787**

Groundwater from Wells #2 and #3 discharge directly into Firebaugh's Intake Canal and does not leave the District's water conveyance system as they are only pumped into the Intake Canal when there is existing demand to withdraw the introduced groundwater (pers. communication Jeff Bryant). Water quality testing by Firebaugh indicate that the two wells do not have TDS, selenium, or boron concentrations that would harm in-district uses once blended with surface water supplies. Well #5 is the only well that pumps directly into the Mendota Pool prior to being withdrawn into the Intake Canal. Results from water quality testing of this well in 2018 are included in Appendix D. TDS for this well was approximately 848 mg/L, boron was 0.65 mg/L, and selenium was non-detect by a detection method of no more than 1 µg/L.

Groundwater Resources in the Action Area

The Proposed Action area overlies the Delta-Mendota Subbasin. The California Department of Water Resources (DWR) has designated the Delta-Mendota Subbasin as critically overdrafted requiring a groundwater sustainability plan (GSP) pursuant to the Sustainable Groundwater Management Act (SGMA) by January 31, 2020 (DWR 2016, 2018a). Firebaugh's service area is included within the San Joaquin River Exchange Contractors Water Authority Groundwater Sustainability Agency (GSA) which have submitted a notice of intent to prepare a GSP for their GSA service area (DWR 2019).

As noted above, groundwater is drawn from a perched aquifer to manage water levels beneath existing crops.

Subsidence

Land subsidence is caused by subsurface movement of earth materials. Principal causes of subsidence within the San Joaquin Valley include: aquifer compaction due to groundwater pumping, hydrocompaction caused by application of water to dry soils, and oil mining. Compaction can be "elastic" or "inelastic". Elastic compaction occurs relatively immediately in response to water level declines which can later be reversed when groundwater levels recover. Inelastic compaction occurs when water levels decline and are not able to rebound (expand) when water levels recover (LSCE & KDSA 2017).

Within the Mendota Pool area, there are three important clay areas: (1) A-clay (approximately 70 feet below ground surface), (2) C-clay (approximately 300 feet below ground surface), and (3) E-clay or Corcoran Clay layer (starting at approximately 750 feet below ground surface) (Schmidt 2019). Wells under the Proposed Action pull ground water from between the A and C-clay layers. Land subsidence within the Action area have been monitored since 1999 from a recorder that measures compaction located approximately 1 mile from the wells that pump under the Proposed Action. Results from the 20-years of monitoring have shown that land subsidence from groundwater pumping from above the Corcoran Clay is generally reversible and insignificant, i.e. 0.05 foot over a 20-year period (Schmidt 2019).

Reclamation surveys a network of over 70 control points across the San Joaquin Valley in July and December of each year to monitor ongoing subsidence. Various other entities, including the U.S. Geological Survey, DWR, the San Luis & Delta-Mendota Water Authority, and the Exchange Contractors also monitor subsidence trends within the Central Valley.

In 2017, a National Aeronautical and Space Administration (NASA) report prepared for DWR documented that the two main subsidence bowls in the San Joaquin Valley (centered on Corcoron and El Nido) previously identified in 2015 had grown wider and deeper between March 2015 and September 2016 and that a third area, near Tranquillity in Fresno County had also intensified (Farr et al. 2017). The maximum total subsidence in these areas during that time was: 22 inches near Corcoran, 16 inches southeast of El Nido, and 20 inches in the new area near Tranquillity (Figure 3).

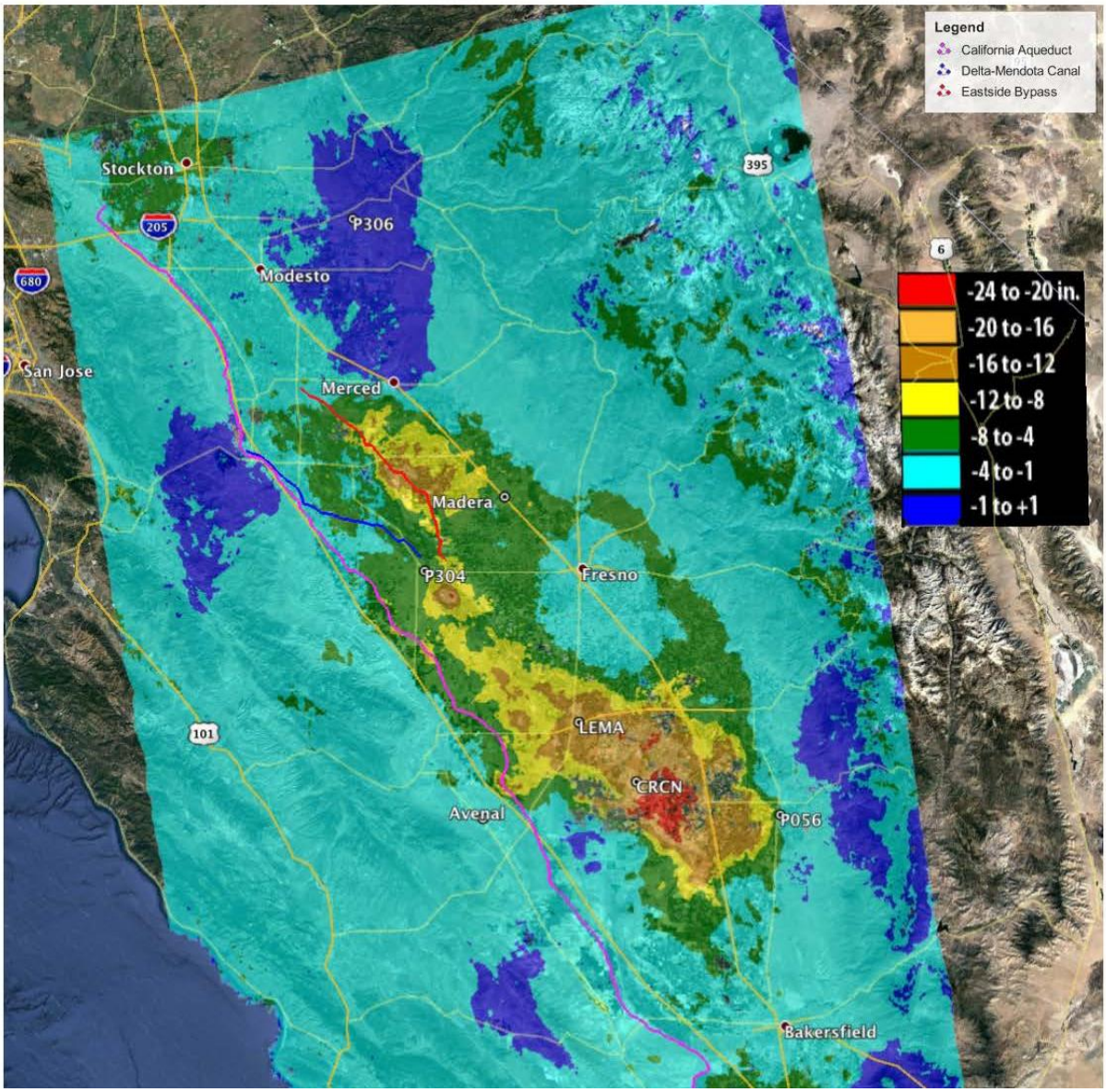

Figure 3 Total Subsidence in the San Joaquin Valley 2015-2016
(Source: Farr et al. 2017)

Annual rates of subsidence within Firebaugh's service area between 2014 and 2018 have ranged from 0-0.15 feet per year between 2014-2015 with an increase to -0.15 to -0.3 feet per year between 2015-2016 and 2016-2017 during the recent drought (San Joaquin River Restoration

Program 2019a, b, c). Rates of subsidence in the Action area (Firebaugh service area) have since reduced from those seen during the recent drought back towards 0.15 to 0 and -0.15 to 0 as shown in the green shaded areas in Figure 4.

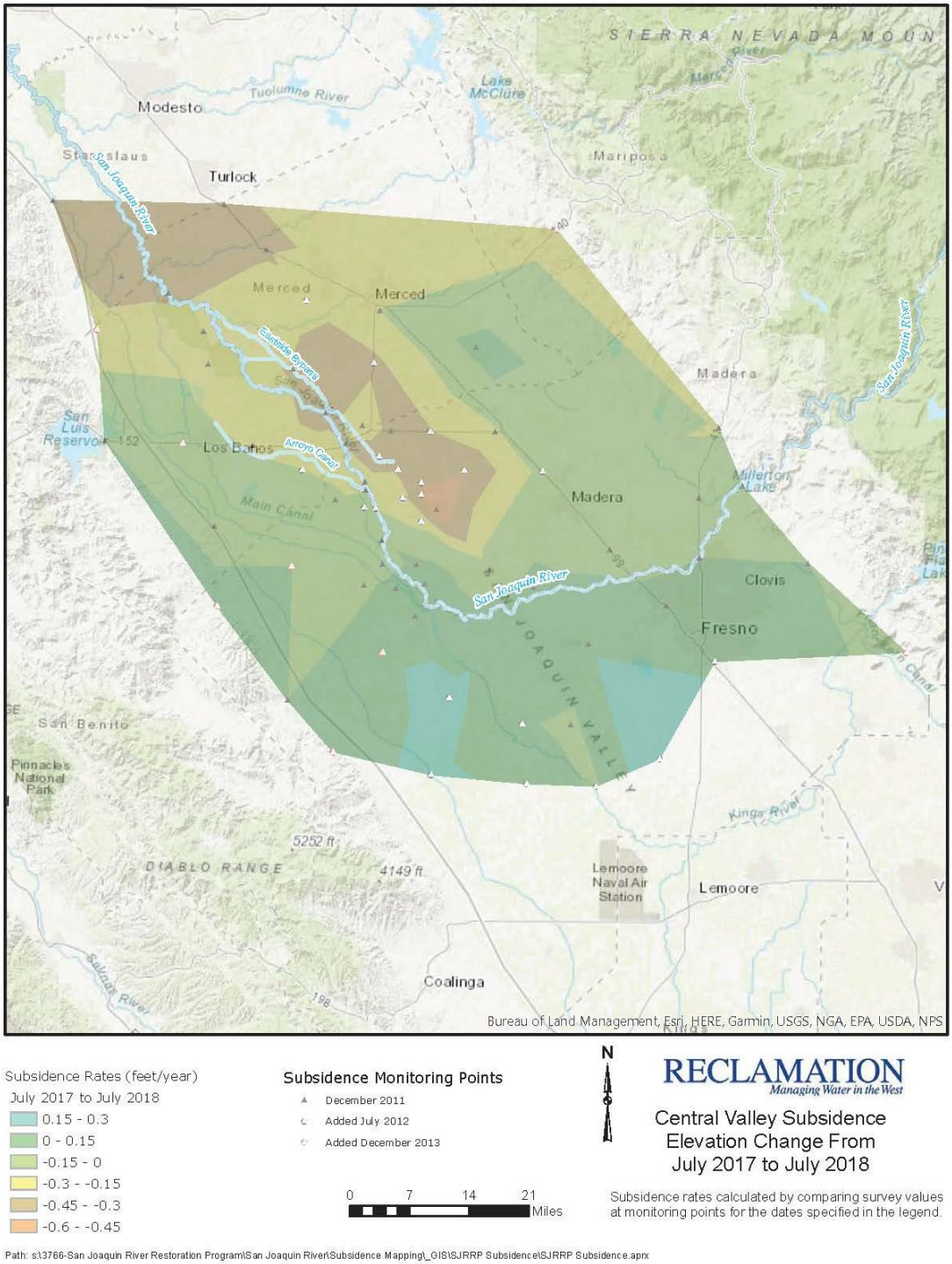

Figure 4 Annual Subsidence Rate in the Central Valley 2017-2018
(Source: San Joaquin River Restoration Program 2019d)

3.3.2 Environmental Consequences

No Action

Under the No Action Alternative, opportunities to address water shortages, especially during drought years, would be reduced as would opportunities for recharge of depleted groundwater. Reclamation would continue to convey and deliver CVP water to Firebaugh and the Transfer Recipient Districts pursuant to their respective CVP contracts as water is available. Firebaugh's CVP water would continue to be used in Firebaugh to meet in-district irrigation demands or for other water transfers as it has in the past.

Firebaugh and its landowners would continue to pump groundwater from the perched shallow aquifer to draw down the water table and protect existing crops.

If other water supplies are not available for the Transfer Recipient Districts, increased groundwater pumping may be needed to meet existing demands and/or increased fallowing may occur.

Proposed Action

The Proposed Action would provide the Transfer Recipient Districts with additional surface water supplies to meet existing demands during periods of water shortages reducing the need for additional groundwater pumping within the respective districts. CVP and State Water Project facilities would not be impacted as the transferred water would be scheduled and approved by Reclamation and DWR in advance.

Data collected for the Mendota Pool Group groundwater pumping program indicates that sediment above the Corcoran Clay layer is composed of coarse grain sediments that are primarily susceptible to elastic compaction, i.e. land subsidence is reversible when groundwater levels recover (LSCE & KDSA 2017, Schmidt 2019). As noted above, monitoring of subsidence within the Action area has only been 0.05 foot over a 20-year period. Further, wells that would pump under the Proposed Action are from wells that pump from a perched shallow aquifer that would continue to be pumped with or without the Proposed Action. Impacts to water levels under the Proposed Action would be temporary until rain events replenish groundwater levels and the perched aquifer refills. Therefore, groundwater pumping from the three Firebaugh wells that are above the Corcoran Clay layer would not cause irreversible subsidence or adversely impact groundwater levels.

Cumulative Impacts

Reclamation has reviewed existing or foreseeable projects in the same geographic area that could affect or could be affected by the Proposed Action. These include various projects (transfers, exchanges, groundwater pumping programs, etc.) such as the following:

- Mendota Pool Group (including Donald J. Peracchi) groundwater pumping and exchange program
- Meyers Groundwater Bank
- Delta-Mendota Canal groundwater pumping program
- Central-California Irrigation District Transfer Program
- Exchange Contractor's 25-year Transfer Program

- Central California Irrigation District and Firebaugh Canal Water District 25-year Groundwater Pumping/Transfer Program to address drainage impacts.

Specific details on each of these can be found in Section 3.0.3 of the Mendota Pool Group Draft Environmental Impact Statement/Environmental Impact Report available at the following website: https://www.usbr.gov/mp/nepa/nepa_project_details.php?Project_ID=36282. In addition, to the projects noted above, there are many local agency and private groundwater wells within the Mendota Pool area adjacent to the Action area, that pump groundwater from above and below the Corcoran Clay. Total pumping in this area ranged from 194,028 acre-feet in 2014 to 95,264 acre-feet in 2011 (Reclamation and Westlands 2018). Firebaugh's pumping is a very small portion of the overall pumping that occurs within this area (approximately 2.4 percent of the total amount pumped in 2014). In addition, as noted previously, groundwater pumped under the Proposed Action is from a perched shallow aquifer that would be pumped regardless. As such, the Proposed Action would not have a substantial cumulative impact on groundwater levels or subsidence within the Action area.

Projects such as those mentioned above are developed by water purveyors to manage limited water supplies due to changes in hydrologic conditions and regulatory requirements. As in the past, hydrological conditions and other factors are likely to result in fluctuating water supplies which drive requests for water service actions. Water districts provide water to their customers based on available water supplies and timing, while attempting to minimize costs. Farmers irrigate and grow crops based on these conditions and factors, and a myriad of water service actions are approved and executed each year to facilitate water needs. It is likely that over the course of the Proposed Action, districts will request various water service actions, such as transfers, exchanges, and Warren Act contracts (conveyance of non-CVP water in CVP facilities). Each water service transaction involving Reclamation undergoes environmental review prior to approval.

The Proposed Action and other similar projects would not hinder the normal operations of the CVP and Reclamation's obligation to deliver water to its contractors or to local fish and wildlife habitat. Since the Proposed Action would not involve construction of new facilities, nor interfere with CVP operations, there would be no cumulative impacts to existing facilities or other contractors.

Overdraft and increased rates of subsidence are ongoing cumulative issues within the San Joaquin Valley (Figure 3 and Figure 4). Due to ongoing hydrologic conditions and/or regulatory constraints that reduce the availability of surface water supplies, it is likely that groundwater levels in the vicinity of the Action Area would continue to decline resulting in increased rates of subsidence until SGMA is fully implemented. However, as shown in Figure 4, rates of subsidence have decreased within the Action area since hydrologic conditions have improved following the recent drought. As the Proposed Action involves wells located within the shallow zone and pull perched groundwater, the three wells involved in the Proposed Action would have minimal if any impacts to the changes in rates of subsidence or groundwater overdraft.

Reclamation requires specific water quality (surface and groundwater), water level, and subsidence monitoring for any groundwater exchange program with federal involvement, such as

the one proposed by Firebaugh. Implementation of avoidance measures and monitoring programs minimize potential impacts to these resources. Therefore, the Proposed Action would not result in cumulative long-term adverse impacts to water levels or subsidence within the Action area.

Section 4 Consultation and Coordination

4.1 Public Review Period

Reclamation provided the public with an opportunity to comment on the Draft FONSI and Draft EA between November 21, 2018 and December 21, 2018. Reclamation received comment letters from Arvin-Edison Water Storage District and the California Department of Fish and Wildlife. The comment letters are included in Appendix E.

Arvin-Edison Water Storage District's comments did not raise concerns or issues specific to the environmental analysis presented in EA-18-025, rather was focused on contractual concerns related to the Exchange Contract. As such, no changes have been made to the EA and no response is required.

California Department of Fish and Wildlife raised the following concerns (1) subsidence and groundwater overdrafting, (2) water quality impacts to the Mendota Pool, (3) cumulative impacts, and (4) impacts to biological resources.

Subsidence and Groundwater Overdrafting

As part of their comments, California Department of Fish and Wildlife requested that Reclamation "provide documentation on whether ground water levels in the Project area during the previous 5-year transfer period have been replenished and the pattern of subsidence has been reversed, due to rain events" as determined by Reclamation in its analysis. As described in Section 3.3.1, groundwater pumping under the Proposed Action, and the previous 5-year transfer program, are from shallow wells above the Corcoran Clay layer. Further, the shallow wells pump perched groundwater that landowners and the District purposely draw down to prevent impacts to existing crops. Additional information has been included in Section 3.3.1.

Water Quality and the Mendota Pool

The comment letter expresses concerns with "salt loading" from the Proposed Action and other groundwater pump-in programs at the Mendota Pool that has impacted water quality at the Mendota Wildlife Area as the salinity of the groundwater is often much greater than the CVP water provided from the Delta-Mendota Canal. California Department of Fish and Wildlife recommends that "If flow from the Firebaugh Canal backs up into the Mendota Pool…pumping from the Hall and City Wells immediately cease."

Wells #2 and #3 (Hall and City wells) are only pumped when there is immediate demand for the water (pers. communication Jeff Bryant). All groundwater pumping is scheduled with Firebaugh in advance and taken as it is introduced so that water cannot back up into the Mendota Pool. Additional information has been added to Section 3.3.1.

Cumulative Impacts

California Department of Fish and Wildlife "recommends that Reclamation include potential impacts from the most relevant projects listed in Table 6 and the Mendota Pool Group 20-year Exchange Program itself" as they "could have substantial cumulative impacts to subsidence and water quality, seriously affecting the infrastructure and fish and wildlife habitat of the MWA."

Reclamation has updated Section 3.3.2 to include relevant projects as part of its cumulative impacts analysis.

Biological Resources

The comment letter expresses concerns related to the "effect of lower water quality and salt loading on sensitive aquatic species including the giant garter snake, especially in the context of other existing and pending projects affecting the water quality of Mendota Pool and the MWA." California Department of Fish and Wildlife "recommends that the cumulative Impacts analysis…include the effects to special status species from this Project and other foreseeable projects."

As described in Section 3.2.2, Reclamation has determined that there would be no cumulative impacts to sensitive species as there would be no direct or indirect impacts from the Proposed Action. Giant garter snakes have experienced population declines historically and recently, and habitat degradation and loss in the Proposed Action area (notably in the Mendota Wildlife Area), but this will not be exacerbated by the Proposed Action.

4.2 List of Agencies and Persons Consulted

Reclamation has consulted with the following regarding the Proposed Action:

- Firebaugh Canal Water District
- San Joaquin River Exchange Contractors
- Pacheco Water District
- Panoche Water District
- San Luis Water District
- Westlands Water District

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Appendix A: Firebaugh Canal Water District Water Transfer Policy

FIREBAUGH CANAL WATER DISTRICT
WATER TRANSFER POLICY

Firebaugh Canal Water District has the right to appropriate water from the San Joaquin River. Under the terms of the Exchange Contract with the Bureau of Reclamation, the District receives substitute water generally delivered through the Delta-Mendota Canal to Mendota Pool. The District will permit the transfer of substitute water pursuant to this policy.

1. Eligible Transferors. Only District landowners may transfer their water allocation. The District will only permit transfer of water from a landowner within the District to his or her land in a recipient District.

2. District Approval. The District strives to manage water transfers so that the water supply, operations, and financial condition of the District and the Exchange Contractors, and water users within the Exchange Contract service area are not unreasonably impacted. In order to obtain District approval of a water transfer proposal, the transferor must demonstrate that the transfer does not unreasonably impact:

   a. The quantity and quality of the water supply available to the District and its water users;

   b. The ability of the District to blend irrigation return flow and drainage water in its canals to meet water quality standards imposed by the Regional Water Quality Control Board;

   c. The Districts operations including, but not limited to the ability of the District to meet its delivery obligations, obtain additional water supplies, and undertake conservation measures, exchanges, and transfers;

   d. The Districts financial condition and its cost of providing water service to its water users;

   e. The ability of the District or its water users to provide drainage to lands, including the ability to meet regulatory requirements relating to the discharge of agricultural drainage; and

   f. Other relevant factors that may create an adverse financial, operations, or water supply impact on the District or its water users.

   g. The ability of neighboring lands to continue to farm and cultivate crops without the fallowed land creating noxious weeds, dust, insect or disease conditions which may impact those neighboring lands.

3. Water Transfer Proposal. All transfers which an individual landowner wishes to make must be presented to the District for processing.
In any water year, the total water to be transferred shall not exceed that quantity of water that the District determines can be safely transferred without adversely impacting the quantity and quality of the water supply available to the District and its water users. The District will also determine the quantity of water for the water year that the District needs in order to provide for blending of irrigation return flow and drainage water in its canal

systems to meet regulatory requirements. The total water allowed to be transferred shall be computed first after considering these factors and, then, after subtracting the quantity of water needed to offset transportation, evaporation, seepage, metering or measurement error, and any amounts necessary to satisfy agreements with the other Exchange Contractors.

4. Consumptive Use Limitation. Only water that would have been consumptively used or irretrievably lost to beneficial use during the term of the transfer may be transferred, and the transfer quantity may not exceed the transferors' allocation of water. The District reserves the right to limit transfers during specific months to the quantity of water that would have been consumptively used or irretrievably lost to beneficial use by the transferor during those months.

5. Correlative Share Limitation. The amount of District water that can be transferred without unreasonable impacts on the District and its water users is limited. The District considers the rights of individual landowners to transfer their water supplies to be limited to a correlative share of the total transferable supply. The District will not approve any transfer proposal that would prevent other landowners from transferring their correlative share of the transferable supply of District water.

6. Groundwater Limitations:

   a. General Limitation. The District will not approve any water transfer involving a substitution of groundwater that the District believes (i) is likely to result in significant long-term adverse impacts on groundwater conditions within the District' s service area, (ii) unreasonably interferes with pumping rates or capacities of wells within the Districts service area, or, (iii) interferes with the Districts ability to meet water quality objectives imposed by the Central Valley Regional Water Quality Control Board or other agency having jurisdiction and regulatory authority of the quality of waters used within or discharged from the Districts service area. This limitation shall also apply to water transfer proposals whereby groundwater extracted from lands within the District service area is wheeled in District facilities for use within the Districts service area.

   b. Critical Year Limitation. The District has determined that groundwater pumping within its boundaries during critical water years as defined by the Exchange Contract results in significant long-term adverse impacts on groundwater conditions within the Districts service area that in turn causes unreasonable impacts on the water supply of the District and its water users; therefore, the District will not approve any water transfer proposal that involves pumping of groundwater in critical water years unless the impacts to water quality can be shown not to effect overall water quality.

7. Transfer Limitations. A transfer will not be approved if the District determines that the water transfer is likely to increase drainage requirements or otherwise cause a deleterious effect on District lands downslope of the lands irrigated as a result of the transfer. The transfer will not be approved unless the Transferor's plan for the lands from which the water will be removed includes a full, detailed and feasible plan to maintain any fallowed lands in a condition in which the lands will not create a risk of insect infestation, disease, dust, noxious weeds or other detrimental condition that may affect neighboring lands and assurances that the plan will be implemented.

8. Compliance with Law and Regulations. Transfer proposals must comply with all provisions of law including but not limited to the provisions of the California Environmental Quality Act (CEQA).

9. Submission of Proposals:

   a. Preliminary Proposals. A transferor may submit a preliminary water transfer proposal to the District prior to the submission of a formal water transfer proposal. The purpose of a preliminary water transfer proposal is to provide the opportunity for informal review by District staff in order to advise the transferor of possible requirements, conditions or objections if a formal proposal is made. The response of the District to a preliminary proposal shall be deemed tentative and subject to change if a formal transfer proposal is made.

   b. Formal Proposals. No later than the date the formal water transfer proposal is submitted to the USBR, the transferor shall submit two (2) complete copies to the District. A proposal shall be deemed complete for purposes of District review only when it has been deemed complete by the USBR and contains sufficient information for the District to determine the impact of the proposed transfer on operations of the District, and that it has been analyzed for compliance with CEQA. The transferor must supply any additional information requested by the District in order to enable the District to effectively review the proposal.

10. Hearings. The District may conduct one or more public hearings in order to determine whether the proposed transfer is likely to have am impact on the water supply, operations and financial condition of the District and its water users, and to ensure compliance with CEQA. The transferor and the transferee, or their representative, shall attend any such hearing if requested to do so by the District in order to respond to questions and comments regarding the impact of the proposed water transfer.

11. Future Modifications. District-approved transfers shall be subject to modification from time to time in order to respond to:

   a. Changes in applicable laws, regulations, contracts and court decisions;

   b. Changed circumstances that cause a transfer to result in unreasonable impacts on the water supply, operations or financial condition of the District or its water users;

   c. Proposals by the water users within the District to transfer their correlative share of the Districts transferable water supply.

12. Costs.

   a. The transferor must demonstrate that the transferor has paid or has made acceptable arrangements to pay all costs associated with developing a complete water transfer proposal, including the costs associated with necessary environmental review and District staff and attorney review necessary to process the transfer proposal.

b. The transferor shall be responsible to pay all costs incurred by the District in processing the water transfer proposal and administering the water transfer itself. Such costs shall be charged to the transferor on a time-and-materials/acre-foot basis in accordance with generally accepted accounting practices. A deposit, in an amount to be fixed by the Board of Directors, shall accompany the proposal. If it appears to the District that the deposit will be inadequate to cover the Districts costs, the District may issue a written cost estimate, or estimates, to the transferor. The transferor shall deposit with the District the funds necessary to meet such supplemental cost estimates. The District shall charge its costs against the transferors' deposits and shall render an accounting to the transferor upon request, but not more often than monthly. Any unexpended portion of the transferors' deposits shall be refunded upon completion of the transfer. If the transferor fails to deposit sufficient funds to cover the Districts costs, the deficiency shall be due upon submission of an invoice from the District to the transferor. If the transferor fails to pay the invoice, the amount due may, at the Districts election, be added to the transferors property taxes or secured by recordation of a lien certificate pursuant to Water Code ' 37212.

13. Charges. Before any water is transferred in a given water year, the transferor shall pay to the District in full:

a. All additional water rates and charges due to the Bureau of Reclamation or other agency that the District is obligated to collect on account of the approved water transfer.

b. The Districts water charges for that years water supply to the land from which the water is being transferred

c. Any standby charges or assessments attributable to the subject land for the year of the transfer, and any delinquencies on account of past water charges, standby charges or assessments.

14. Indemnification. The transferor and transferee are required to defend, indemnify, and hold harmless the District against any claims of third parties that the transfer:

a. Violates the terms of the Second Amended Contract for Exchange of Waters, Contract No. Ilr-1144, dated February 14, 1968;

b. Is not a beneficial or reasonable use of water;

c. Violates any law or regulation including, but not limited to the National Environmental Policy Act (NEPA), CEQA, State and Federal Endangered Species acts, water quality statutes, and Area of Origin laws; or

d. Has caused or will cause injury or damage to any person or property, including violations of any contracts, leases, trust deeds or water rights.

The transferor and transferee are also required to defend, indemnify and hold harmless the District from any claims that the transferor or transferees have breached any contractual or

statutory duties pertaining to the transfer.
In addition, the transferor shall relinquish for the duration of the approved transfer all entitlement to receive the water supply that is the subject of the approved transfer. The transferor and transferee shall abide by the termination date of the transfer unless extended in the manner provided by law and shall not contest the return of the transferred water supply to the Districts service area upon such termination.

The transferor shall provide the necessary assurances to the District that the transferee has agreed to abide by the termination date as set forth above and that the transferee has agreed to waive any claim of dependency, detrimental reliance, or intervening public use as a basis for extending the water transfer beyond its approved term.

Prior to approval of the proposed transfer, the transferor shall deliver to the District an agreement, in a form acceptable to the District, signed by the transferor and the transferee, by which they agree to conform to this policy, and in particular to the requirements of this Section.

The agreement shall provide among other terms for the compliance with the plan for maintenance of the land and facilities upon the land from which the water is transferred in such a condition that the land will not create a risk of detrimental impacts to surrounding lands. The District shall be granted the right to perform those measures at the cost of the transferor if the measures are not fully and timely complied with.

15. Water Transfers. Water Transfers for use of water outside of the District boundaries may only be accomplished with the written agreement and compliance with the agreement terms established by the Board of Directors and only in compliance with Federal and State law. Transfers to lands outside of the District boundaries are not a matter of right. If any terms of a written agreement specifying the means and conditions of a transfer shall be violated or fail to be performed, the landowner shall be subject to the penalties provided under the terms of the agreement but shall further be barred from receiving water upon any lands within the boundaries of the District until such time as the District Board of Directors shall determine that the transfer agreement terms have been fully complied with. A breach of the terms of a water transfer agreement which cannot be remedied by physical performance may result in a suspension of the right to receive water for up to one calendar year after a hearing is conducted by the Board of Directors, in addition to the remedies, fines or penalties established under the written agreement and under these rules and regulations.

The foregoing policy was adopted by the Firebaugh Canal Water District at a regular meeting of its Board of Directors on March 11, 1993 and revised in the same manner on October 16, 2001, July 20, 2004 and May 15, 2012.

Appendix B: San Luis Water District Letter

Attachment C.

LAW OFFICES OF
GARY W. SAWYERS

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May 3, 2006

VIA FACSIMILE ONLY
(559) 487-5397

Ms. Kathy Wood
Chief, Resource Management Division
Bureau of Reclamation
South-Central California Area Office
1243 "N" Street
Fresno, CA 93721

Re: San Luis Water District
Our File No. 52120.001

Dear Kathy:

In connection with the pending Agreement for the Acquisition of Water by the United States, San Luis & Delta-Mendota Water Authority, and Madera Irrigation District from the San Joaquin River Exchange Contractor Water Authority, I understand that Reclamation requires certain confirmations from the San Luis Water District. As you know, I am general counsel to the District. On behalf of the District, I hereby confirm that the District will not deliver Central Valley Project water to development or converted habitat without confirmation from the Bureau of Reclamation or other evidence that compliance with the Endangered Species Act has occurred with respect to the subject land either through Section 7 or Section 10 of the Act.

If you have any questions or need further confirmation, please contact me.

Very truly yours,

Gary W. Sawyers

GWS:lj
cc: Mr. Martin McIntyre (via facsimile only)
Mr. Daniel Nelson (via facsimile only)

Appendix C: Reclamation’s Cultural Resource Determination

CULTURAL RESOURCE COMPLIANCE
Reclamation Division of Environmental Affairs
MP-153

MP-153 Tracking Number: 18-SCAO-162

Project Name: Firebaugh Canal Water District (Firebaugh) 5-Year Transfer Program

NEPA Document: EA-18-025

NEPA Contact: Kate Connor, Natural Resources Specialist

MP-153 Cultural Resources Reviewer: Joanne Goodsell, Archaeologist

Date: August 28, 2018

Reclamation proposes to approve a series of annual transfers over a five year period (calendar year 2019 through 2023) of up to 7,500 AFY of the Firebaugh's Central Valley Project (CVP) contract supplies to Pacheco Water District, San Luis Water District, and Westlands Water District (Transfer Recipient Districts). In order to make its CVP supplies available for the transfers, Firebaugh would pump up to 17 cubic feet per second of groundwater from four existing wells to meet in-district demands, in lieu of taking surface water deliveries dedicated to Firebaugh under the Exchange Contract. The pumped groundwater would be delivered to the Transfer Recipient Districts through existing facilities, involving no ground disturbance or new construction.

Reclamation determined the proposed action is the type of Federal undertaking that has no potential to cause effects on historic properties, assuming such properties be present, pursuant to 36 CFR § 800.3(a)(1). As such, Reclamation has no further obligations under 54 U.S.C. § 306108, commonly known as Section 106 of the National Historic Preservation Act. The proposed action will result in no impacts to cultural resources.

This document conveys the completion of the cultural resources review and Section 106 process for this undertaking. Please retain a copy of this document with the administrative record for the proposed action. Should the proposed action change, additional review under Section 106, possibly including consultation with the State Historic Preservation Officer, may be required.

Appendix D: Water Quality Testing for Wells

Well Number 5: #5 in EA

Owned by the City of Mendota

Utilized through Exchange Agreement with B & B Limited

P.O. Box 6

Firebaugh, CA 93622

Hall Well: #2 In EA

Owned and Operated by Almendra Farming LLC

44474 West Nees Avenue

Firebaugh, CA 93622

City Well: #3 in EA

Owned by the City of Mendota

Leased to the Firebaugh Canal Water District

P.O. Box 97

Mendota, CA 93640

908 North Temperance Ave. ∇ Clovis, CA 93611 ∇ Phone 559-275-2175 ∇ Fax 559-275-4422

NELAP Certification number: CA00046 (HW)
State Certification Number: CA1312 (WW & DW)

July 12, 2018

Firebaugh Canal Water District
P.O. Box 97
Mendota, California 93640

Attn: Jeff Bryant

Subject: Report of Data: Case 86203

Results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Dear Mr. Bryant,

Three water samples were received on June 29, 2018, in good condition. Written results are being provided on this July 12, 2018, for the requested analyses.

For the EPA 200.7 and 200.8 analyses, the samples were digested according to EPA method 200.7/11.2. Sodium adsorption ratio was calculated.

For the EPA 300.0, SM 2320B, SM 2510B, SM 2540C, and SM 4500H+B analyses, the samples were prepared according to the methods. Nitrate is reported as NO3 in mg/L (ppm). The samples were analyzed as soon as possible for pH. All other holding times were met. In the method blanks, electrical conductivity, bicarbonate and total alkalinity were detected above the reporting limit; electrical conductivity, bicarbonate and total alkalinity in the samples exceeds the blank concentration by ten-fold or more.

No other unusual problem or complication was encountered with this sample set.

If you have any questions or require further information, please contact us at your convenience. Thank you for choosing APPL, Inc.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. These test results meet all requirements of NELAC. Release of the hard copy has been authorized by the Laboratory Manager or her designee, as verified by the following signature.

Paula McCartney

Paula McCartney, Laboratory Director
APPL, Inc.

PM/rp
Enclosure
cc: File

Number of pages in this report ____

Results

Firebaugh Canal Water District
P.O. Box 97
Mendota, CA 93640

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Jeff Bryant

Sample ID: CITY WELL
Sample Collection Date: 06/28/18

APPL ID: AZ75924
ARF: 86203

Analyte	Method	Result	PQL	Dilution	Units	Prep Date	Analysis Date
BICARBONATE AS CACO3	SM 2320B	201	2.0	1	mg/L	07/02/18	07/02/18
BORON (B)	200.7/11.2	2.0	0.025	1	mg/L	07/03/18	07/09/18
CALCIUM (CA)	200.7/11.2	124	0.05	1	mg/L	07/03/18	07/09/18
CARBONATE AS CACO3	SM 2320B	ND	2.0	1	mg/L	07/02/18	07/02/18
CHLORIDE	EPA 300.0	446	50.0	50	mg/L	07/02/18	07/02/18
HYDROXIDE AS CACO3	SM 2320B	ND	2.0	1	mg/L	07/02/18	07/02/18
MAGNESIUM (MG)	200.7/11.2	24.6	0.025	1	mg/L	07/03/18	07/09/18
NITRATE	EPA 300.0	ND	2.5	5	mg/L	06/30/18	06/30/18
PH	SM4500HB	7.59@15.1C	1.0	1	pH Units	07/02/18	07/02/18
POTASSIUM (K)	200.7/11.2	7.7	0.5	1	mg/L	07/03/18	07/09/18
SELENIUM (SE)	200.8	ND	0.001	1	mg/L	07/03/18	07/05/18
SODIUM (NA)	200.7/11.2	675	0.5	1	mg/L	07/03/18	07/09/18
SODIUM ADSORPTION RATIO	calc	14.5		1	na	07/03/18	07/09/18
SPECIFIC CONDUCTANCE	SM 2510B	3470	3.0	1	umhos/cm @ 25C	07/03/18	07/03/18
SULFATE	EPA 300.0	912	50.0	50	mg/L	07/02/18	07/02/18
TOTAL ALKALINITY AS CACO3	SM 2320B	201	2.0	1	mg/L	07/02/18	07/02/18
TOTAL DISSOLVED SOLIDS	SM2540C	2330	20	2	mg/L	07/03/18	07/03/18

Reported: 07/12/18 4:04:27 PM

Multi-Analysis Report

Results

Firebaugh Canal Water District
P.O. Box 97
Mendota, CA 93640

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Jeff Bryant

Sample ID: HALL WELL #1
Sample Collection Date: 06/28/18

APPL ID: AZ75925
ARF: 86203

Analyte	Method	Result	PQL	Dilution	Units	Prep Date	Analysis Date
BICARBONATE AS CACO3	SM 2320B	172	2.0	1	mg/L	07/02/18	07/02/18
BORON (B)	200.7/11.2	1.1	0.025	1	mg/L	07/03/18	07/09/18
CALCIUM (CA)	200.7/11.2	32.7	0.05	1	mg/L	07/03/18	07/09/18
CARBONATE AS CACO3	SM 2320B	ND	2.0	1	mg/L	07/02/18	07/02/18
CHLORIDE	EPA 300.0	434	20.0	20	mg/L	07/02/18	07/02/18
HYDROXIDE AS CACO3	SM 2320B	ND	2.0	1	mg/L	07/02/18	07/02/18
MAGNESIUM (MG)	200.7/11.2	5.1	0.025	1	mg/L	07/03/18	07/09/18
NITRATE	EPA 300.0	ND	1.0	2	mg/L	06/30/18	06/30/18
PH	SM4500HB	7.75@15.1C	1.0	1	pH Units	07/02/18	07/02/18
POTASSIUM (K)	200.7/11.2	6.1	0.5	1	mg/L	07/03/18	07/09/18
SELENIUM (SE)	200.8	ND	0.001	1	mg/L	07/03/18	07/05/18
SODIUM (NA)	200.7/11.2	464	0.5	1	mg/L	07/03/18	07/09/18
SODIUM ADSORPTION RATIO	calc	19.9		1	na	07/03/18	07/09/18
SPECIFIC CONDUCTANCE	SM 2510B	2230	3.0	1	umhos/cm @ 25C	07/03/18	07/03/18
SULFATE	EPA 300.0	281	20.0	20	mg/L	07/02/18	07/02/18
TOTAL ALKALINITY AS CACO3	SM 2320B	172	2.0	1	mg/L	07/02/18	07/02/18
TOTAL DISSOLVED SOLIDS	SM2540C	1350	20	2	mg/L	07/03/18	07/03/18

Reported: 07/12/18 4:04:27 PM

Multi-Analysis Report

Results

Firebaugh Canal Water District
P.O. Box 97
Mendota, CA 93640

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Jeff Bryant

Sample ID: WELL #5
Sample Collection Date: 06/28/18

APPL ID: AZ75926
ARF: 86203

Analyte	Method	Result	PQL	Dilution	Units	Prep Date	Analysis Date
BICARBONATE AS CACO3	SM 2320B	144	2.0	1	mg/L	07/02/18	07/02/18
BORON (B)	200.7/11.2	0.65	0.025	1	mg/L	07/03/18	07/09/18
CALCIUM (CA)	200.7/11.2	42.1	0.05	1	mg/L	07/03/18	07/09/18
CARBONATE AS CACO3	SM 2320B	ND	2.0	1	mg/L	07/02/18	07/02/18
CHLORIDE	EPA 300.0	ND	10.0	10	mg/L	07/02/18	07/02/18
HYDROXIDE AS CACO3	SM 2320B	ND	2.0	1	mg/L	07/02/18	07/02/18
MAGNESIUM (MG)	200.7/11.2	12.0	0.025	1	mg/L	07/03/18	07/09/18
NITRATE	EPA 300.0	ND	0.5	1	mg/L	06/30/18	06/30/18
PH	SM4500HB	7.35@15.2C	1.0	1	pH Units	07/02/18	07/02/18
POTASSIUM (K)	200.7/11.2	4.0	0.5	1	mg/L	07/03/18	07/09/18
SELENIUM (SE)	200.8	ND	0.001	1	mg/L	07/03/18	07/05/18
SODIUM (NA)	200.7/11.2	243	0.5	1	mg/L	07/03/18	07/09/18
SODIUM ADSORPTION RATIO	calc	8.5		1	na	07/03/18	07/09/18
SPECIFIC CONDUCTANCE	SM 2510B	1340	3.0	1	umhos/cm @ 25C	07/03/18	07/03/18
SULFATE	EPA 300.0	275	10.0	10	mg/L	07/02/18	07/02/18
TOTAL ALKALINITY AS CACO3	SM 2320B	144	2.0	1	mg/L	07/02/18	07/02/18
TOTAL DISSOLVED SOLIDS	SM2540C	848	10	1	mg/L	07/03/18	07/03/18

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Multi-Analysis Report

METALS BLANK

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Method	Analyte	Result	PQL	Units	Prep Date	Analysis Date	QC Group
200.8	SELENIUM (SE)	Not detected	0.001	mg/L	07/03/18	07/05/18	#2008M-180703B-AZ75869
200.7/11.2	BORON (B)	Not detected	0.025	mg/L	07/03/18	07/09/18	#2007M-180703B-AZ75926
200.7/11.2	CALCIUM (CA)	Not detected	0.05	mg/L	07/03/18	07/09/18	#2007M-180703B-AZ75926
200.7/11.2	MAGNESIUM (MG)	Not detected	0.025	mg/L	07/03/18	07/09/18	#2007M-180703B-AZ75926
200.7/11.2	POTASSIUM (K)	Not detected	0.5	mg/L	07/03/18	07/09/18	#2007M-180703B-AZ75926
200.7/11.2	SODIUM (NA)	Not detected	0.5	mg/L	07/03/18	07/09/18	#2007M-180703B-AZ75926

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Laboratory Control Spike Recovery

METALS

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Method	Compound Name	Spike Level mg/L	SPK Result mg/L	SPK % Recovery	Recovery Limits	Extract Date	Analysis Date	QC Group
EPA 200.7	BORON (B)	0.250	0.24	96.0	80-120	07/03/18	07/09/18	#2007M-180703B-AZ75926
EPA 200.7	CALCIUM (CA)	25.0	24.4	97.6	80-120	07/03/18	07/09/18	#2007M-180703B-AZ75926
EPA 200.7	MAGNESIUM (MG)	25.0	24.3	97.2	80-120	07/03/18	07/09/18	#2007M-180703B-AZ75926
EPA 200.7	POTASSIUM (K)	5.00	4.8	96.0	80-120	07/03/18	07/09/18	#2007M-180703B-AZ75926
EPA 200.7	SODIUM (NA)	25.0	24.6	98.4	80-120	07/03/18	07/09/18	#2007M-180703B-AZ75926

Comments: _____

Laboratory Control Spike Recovery
METALS

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Method	Compound Name	Spike Level mg/L	SPK Result mg/L	SPK % Recovery	Recovery Limits	Extract Date	Analysis Date	QC Group
200.8	SELENIUM (SE)	0.100	0.090	90.0	80-120	07/03/18	07/05/18	#2008M-180703B-AZ75869

Comments: _____

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APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Method	Analyte	Result	PQL	Units	Prep Date	Anal Date	QC Group
SM 2320B	BICARBONATE AS CACO3	4.5	2.0	mg/L	07/02/18	07/02/18	#232W-180702A-AZ75899
SM 2320B	CARBONATE AS CACO3	Not detected	2.0	mg/L	07/02/18	07/02/18	#232W-180702A-AZ75899
SM 2320B	HYDROXIDE AS CACO3	Not detected	2.0	mg/L	07/02/18	07/02/18	#232W-180702A-AZ75899
SM 2320B	TOTAL ALKALINITY AS CAC	4.5	2.0	mg/L	07/02/18	07/02/18	#232W-180702A-AZ75899
EPA 300.0	NITRATE	Not detected	0.5	mg/L	06/29/18	06/29/18	#300W-180629A3-AZ7592
EPA 300.0	CHLORIDE	Not detected	1.0	mg/L	07/02/18	07/02/18	#300WD-180702A-AZ7592
EPA 300.0	SULFATE	Not detected	1.0	mg/L	07/02/18	07/02/18	#300WD-180702A-AZ7592
SM 2510B	SPECIFIC CONDUCTANCE	4.3	3.0	umhos/cm @ 25C	07/03/18	07/03/18	#EC-180703C-AZ75878
SM2540C	TOTAL DISSOLVED SOLIDS	Not detected	10	mg/L	07/03/18	07/03/18	#TDS2-A180703-AZ75924

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Laboratory Control Spike Recoveries

WETLAB

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Method	Compound Name	Spike Lvl mg/L	SPK Res mg/L	DUP Res mg/L	SPK % Recov	DUP % Recov	RPD	RPD Max	QC Limits	Extract Date-Spk	Analysis Date-Spk	Extract Date-Dup	Analysis Date-Dup	QC Group
EPA 300.0	CHLORIDE	20.0	18.5	18.6	92.5	93.0	0.54	20	90-110	07/02/18	07/02/18	07/02/18	07/02/18	#300WD-180702A-AZ7592
EPA 300.0	SULFATE	20.0	18.9	18.9	94.5	94.5	0.0	20	90-110	07/02/18	07/02/18	07/02/18	07/02/18	#300WD-180702A-AZ7592
EPA 300.0	NITRATE	22.1	21.2	21.7	95.9	98.2	2.3	20	90-110	06/30/18	06/30/18	06/30/18	06/30/18	#300W-180629A3-AZ7592
SM 2320B	BICARBONATE AS CACO3	250	270	231	108	92.4	15.6	20	90-110	07/02/18	07/02/18	07/02/18	07/02/18	#232W-180702A-AZ75899
SM 2320B	TOTAL ALKALINITY AS CA	250	270	231	108	92.4	15.6	20	90-110	07/02/18	07/02/18	07/02/18	07/02/18	#232W-180702A-AZ75899
SM2540C	TOTAL DISSOLVED SOLID	221	217	215	98.2	97.3	0.93	20	80-120	07/03/18	07/03/18	07/03/18	07/03/18	#TDS2-A180703-AZ75924

Comments: _____

Laboratory Control Spike Recoveries

WETLAB

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Method	Compound Name	Spike Lvl	SPK Res	DUP Res	SPK %	DUP %	RPD	RPD	QC	Extract	Analysis	Extract	Analysis	QC Group
		ıhos/cm @ 2	ıos/cm @	ıos/cm @	Recov	Recov		Max	Limits	Date-Spk	Date-Spk	Date-Dup	Date-Dup	
SM 2510B	SPECIFIC CONDUCTANC	1412	1400	1420	99.2	101	1.4	20	80-120	07/03/18	07/03/18	07/03/18	07/03/18	#EC-180703C-AZ75878

Comments: _____

WETLAB

Sample/Sample Duplicate Results

Firebaugh Canal Water District
P.O. Box 97
Mendota, CA 93640

Attn: Jeff Bryant

Sample ID: AZ75924
Client ID: CITY WELL

APPL Inc.
908 North Temperance Avenu
Clovis, CA 93611

ARF: 86203

Method	Analyte	Sample ID	Sample Result	Sample Dup Result	RPD	RPD Max	PQL	Units	Sample Extract Date	Sample Analysis Date	Sample Dup Extract Date	Sample Dup Analysis Date
SM2540C	TOTAL DISSOLVED SOLIDS	AZ75924	2330	2310	0.9	20	20	mg/L	07/03/18	07/03/18	07/03/18	07/03/18

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Appendix E: Comment Letters Received

ARVIN-EDISON WATER STORAGE DISTRICT

December 21, 2018

Via First Class and Electronic Mail: (mconnor@usbr.gov)

Kate Connor
United States Department of the Interior
Bureau of Reclamation
South-Central California Area Office
1243 N Street
Fresno, CA 93727

Re: Arvin-Edison Water Storage District's Comments on November 2018 Draft Finding of No Significant Impact for Firebaugh Canal Water District 5-Year Transfer Program (the "Project"), FONSI 18-025 (the "Fonsi")

Dear Ms. Connor:

The Arvin-Edison Water Storage District ("Arvin-Edison") submits the following comments to the above-referenced draft FONSI for the above-referenced Project released by the Bureau of Reclamation ("Bureau").

Arvin-Edison's service area comprises approximately 132,000 acres of prime farmland supplied with water from surface and groundwater supplies. Arvin-Edison was organized in 1942 for the express purpose of contracting with the United States through the Bureau for water service from the Central Valley Project ("CVP"). The 9(d) Repayment Contract between the Bureau and Arvin-Edison for water service from the Friant Division of the CVP provides for receipt of San Joaquin River water stored in Millerton Lake delivered through the Friant Kern Canal.

The water supplies and facilities comprising the Friant Division of the CVP was conceived, designed and constructed based on the terms stated in certain contracts entered into by the United States, acting through the Department of Interior and the predecessors in interest of, among others, the Firebaugh Canal Water District ("Firebaugh"). These contracts include that certain "Contract for Exchange of Waters" dated July 27, 1939 (as amended by the "Second Amended Contract for Exchange of Waters" dated December 6, 1967, the "Exchange Contract").

Arvin-Edison observes that the FONSI does not appear to discuss the Bureau's efforts to ensure compliance with the terms and conditions of the Exchange Contract in carrying out the Project, including the Exchange Contract's express restrictions on the place of use, acreage and associated use of "substitute water" (as defined therein) delivered to Firebaugh and other related companies (Article 6), and on the on the total quantity of substitute water to be delivered (Article 8).

20401 Bear Mountain Boulevard · P.O. Box 175 · Arvin, CA 93203
Telephone (661) 854-5573 · Fax (661) 854-5213 · E-mail: arvined@aewsd.org

Given the connection between the Exchange Contract and Arvin-Edison's San Joaquin River water supply from the Friant Division of the CVP under its permanent Repayment Contract, Arvin-Edison is interested in the proper administration of the Exchange Contract, and requests that the Bureau take all necessary actions to ensure that the Project is carried out in a manner that strictly adheres to the terms and conditions of these agreements and does not result in an impermissible use of water.

Respectfully Submitted,

Jeevan Muhar
Engineer-Manager

cc: Board of Directors
Ernest Conant, Esq.
Alan Doud, Esq.
Steve Collup, Director of Water Resources

JSM:AD:sj\AEWSD\USBR\Enviro.docs\2018\Connor.Kate.AE.Comments.Draft.FONSI.Firebaugh.CWD.trans.prog.12.18.docx

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State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Central Region
1234 East Shaw Avenue
Fresno, California 93710
(559) 243-4005
www.wildlife.ca.gov

EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director

December 19, 2018

Kate Connor
United States Bureau of Reclamation
1234 N Street
Fresno, California 93721
mconnor@usbr.gov

Subject: Draft Finding of No Significant Impact (FONSI) 18-025
Draft Environmental Assessment (EA) 18-025
Firebaugh Canal Water District (Firebaugh) 5-Year Transfer Program

Dear Ms. Connor:

The California Department of Fish and Wildlife (CDFW) has reviewed the Draft EA and FONSI for the Firebaugh Canal Water District 5-Year Transfer Program (Project). The United States Department of the Interior, Bureau of Reclamation (BOR) is the Lead Agency pursuant to the National Environmental Protection Act (NEPA) for the Draft FONSI and EA; which analyzes the impacts of approving a series of annual transfers between 2019 and 2023 of up to 7,500 acre-feet per year (AFY) of Firebaugh's Exchange Contract Central Valley Project (CVP) water supplies to Pacheco Water District, San Luis Water District, and Westlands Water District (Transfer Recipient Districts). The proposed transfers would occur from April through December of each year and would not exceed the maximum of 37,500 AF over the five-year period.

In lieu of taking CVP surface water deliveries under the Exchange Contract, Firebaugh would pump up to 17 cubic feet per second (cfs) of groundwater (for a maximum of 36 AF/day) from three wells. Well specifications for the three wells include:

- Well #2 or Hall Well: 5 cfs well estimated to pump up to 3,500 AFY
- Well #3 or City Well: 3 cfs well estimated to pump up to 1,500 AFY
- Well #5: 9 cfs well estimated to pump up to 2,500 AFY

The pumped groundwater would be conveyed in Firebaugh's existing conveyance system, making 7,500 AF of CVP water under the Exchange Contract available to be delivered to the Transfer Recipient Districts via the Delta-Mendota Canal and the San Luis Canal. Groundwater from Well #2 and Well #3 would be directly discharged into

Firebaugh's Intake Canal and would not enter Mendota Pool. Groundwater from Well #5 would be directly discharged into Mendota Pool, where it would then enter Firebaugh's Intake Canal for internal distribution to its landowners.

Land Subsidence, Groundwater Over Drafting, and Impacts to Mendota Wildlife Area

The Delta-Mendota Subbasin is designated as critically overdrafted by the California Department of Water Resources, and such overdrafting is a serious issue within the Mendota Pool area due to ongoing subsidence. Over the years, the Mendota Dam has experienced subsidence, and the California Department of Water Resources, Division of Safety of Dams has required the water level to be lowered due to the subsequent compromised integrity of the dam. The lowered water level at the dam has resulted in lower water levels to the gravity flow and lift pump inlets at the CDFW Mendota Wildlife Area (MWA). The northernmost gravity flow inlet receives no water, causing loss of trees and habitat along the northern edge of the wildlife area. The lift stations no longer pump efficiently because the inlets are not fully covered with water, allowing air to be pulled into the pumps and decreasing water flows. Decreased water flow results in MWA operating its pumps for longer periods, increases the electricity cost and personnel cost to monitor and maintain the pumps, and increases wear and tear on the pumps.

The EA-FONSI analysis references subsidence mapping from the BOR showing that the Project area involved with groundwater pumping has subsided from 0 to 0.15 feet (i.e., 0 – 1.8 inches) between 2012 and 2018. While the EA-FONSI addresses subsidence, its impact analysis omits a December 2016 National Aeronautics and Space Administration (NASA) Jet Propulsion Laboratory (JPL) Progress Report: Subsidence in California, March 2015 – September 2016 (NASA Report) (https://www.jpl.nasa.gov/news/news.php?feature=6761). This report details subsidence in the San Joaquin Valley and demonstrates that the Proposed Action area has in actuality subsided between 4 and 8 inches between May 7, 2015, and September 10, 2016, when pumping occurred during the previous 5-year transfer program. The NASA Report shows additional subsidence of nearly 2 feet in the Fresno Slough, near the community of Tranquillity, during the same timeframe. The data presented in the NASA Report conflicts with the subsidence data presented in the EA-FONSI. CDFW recommends inclusion of the data from the NASA Report with BOR's subsidence impact analysis.

The EA-FONSI states that impacts to water levels under the Proposed Action would be temporary until rain events are able to replenish groundwater levels, and that groundwater pumping from the three Firebaugh wells that are above the Corcoran Clay layer would not cause irreversible subsidence. Since the proposal is an extension of an existing 5-year transfer, CDFW requests that the BOR analysis provide documentation on whether ground water levels in the Project area during the previous 5-year transfer period have been replenished and the pattern of subsidence has been reversed, due to rain events.

Water Quality

The Project would transfer up to 35,000 AFA of CVP surface flow that would have otherwise entered the Mendota Pool via the Delta Mendota Canal (DMC). Firebaugh would instead pump an equal amount of groundwater from three of its wells into its service area, including the Mendota Pool. In prior years, water quality monitoring results have demonstrated that groundwater supplied to the Mendota Pool is consistently more saline than surface waters within the DMC. Consequently, CDFW is concerned with this "salt loading" into the Mendota Pool and the impact this has to the water supply for its MWA. Also note that higher salinity correlates with higher total dissolved solids (TDS).

The Project proposes to pump groundwater from Well #5 into the Mendota Pool only when the Fresno Slough flows to the south towards the MWA. Table 2.2.1 (Environmental Commitments) of the Draft EA and FONSI states that well water with TDS concentrations greater than 1,600 milligrams per liter (mg/L) would not be pumped into Mendota Pool, and during the fall months when flow is reduced to the MWA, well water with TDS higher than 1,200 mg/L will not be pumped into Mendota Pool. These upper limits are considered very high when compared to the daily mean TDS water quality objective for the MWA of 800 mg/L or less (Reclamation Water Contract Number 14-OC-200 for Refuge Water Supplies to MWA). The addition of water with TDS higher than 800 mg/L will significantly increase the salinity of the receiving waters in the MWA. CDFW recommends that pumping from Well #5 into the Mendota Pool cease when the TDS exceed 800 mg/L. The 848 mg/L Well #5 measurement reported in the Draft EA and FONSI could be acceptable if Firebaugh can demonstrate that the TDS upstream of Well #5 is diluted to below 800 mg/L in the Mendota Pool area.

The Water Quality report (EA-FONSI Attachment D) provides TDS measurements of 2330 mg/L from Well #2 (Hall Well) and 1350 mg/L from #3 (City Well). CDFW staff from the MWA have observed that when these wells are pumping into the Firebaugh Canal during times of insufficient demand in the Firebaugh Canal system, the flow in the canal can back up into the Mendota Pool. If flow from the Firebaugh Canal backs up into the Mendota Pool, CDFW recommends that pumping from the Hall and City Wells immediately cease.

Cumulative Impacts

The Cumulative Impacts section of the EA-FONSI does not list any existing or foreseeable projects in the area of the proposed Project. CDFW has received the Draft Environmental Impact Statement / Environmental Impact Report for the Mendota Pool Group 20-year Exchange Program (DEIS/EIR, State Clearinghouse No. 2013041028). Table 6 of the DEIR/EIS lists twenty-four approved and pending projects related to the Mendota Pool Group 20-year Exchange Program, including this Project. CDFW recommends that Reclamation include potential impacts from the most relevant projects listed in Table 6 and the Mendota Pool Group 20-year Exchange Program itself. These

projects could have substantial cumulative impacts to subsidence and water quality, seriously affecting the infrastructure and fish and wildlife habitat of the MWA.

Biological Resources

Special status species in the Project vicinity include the State and Federally threatened giant garter snake (*Thamnophis gigas*), the State threatened Swainson's hawk (*Buteo swainsoni*), the State candidate tricolored blackbird (*Agelaius tricolor*), the State threatened and Federally endangered San Joaquin kit fox (*Vulpes macrotis mutica*), and the State species of special concern burrowing owl (*Athene cunicularia*). Of particular concern to CDFW is the effect of lower water quality and salt loading on sensitive aquatic species including the giant garter snake, especially in the context of other existing and pending projects affecting the water quality of Mendota Pool and the MWA. The Draft EA and FONSI acknowledges the sensitivity of giant garter snake in the Project area and potential for local extirpation. CDFW recommends that the cumulative Impacts analysis described above include the effects to special status species from this Project and other foreseeable projects.

Should you have any questions regarding these comments, please contact Annette Tenneboe, Senior Environmental Scientist (Specialist), at (559) 243-4014 extension 231, by email at Annette.Tenneboe@wildlife.ca.gov, or by writing to the address in the letterhead above.

Sincerely,

Julie A. Vance.
Regional Manager

ec: Shauna McDonald; smcdonald@usbr.gov
United States Bureau of Reclamation

Patricia Cole; Patricia_cole@fws.gov
United States Fish and Wildlife Service

California Department of Fish and Wildlife:
Steve Brueggemann
Annee Ferranti
Andrew Gordus
Jeffrey Shu
Annette Tenneboe

REFERENCES

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