Long-Term Water Transfers Environmental Impact Statement/ Environmental Impact Report

Final

U.S. Department of the Interior
Bureau of Reclamation
Mid-Pacific Region
Sacramento, California

San Luis & Delta-Mendota
Water Authority

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Prepared by

United States Department of the Interior
Bureau of Reclamation
Mid-Pacific Region

San Luis & Delta-Mendota Water Authority

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Los Banos, California

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Final Environmental Impact Statement/Environmental Impact Report

Lead Agencies: U.S. Department of the Interior, through the Bureau of Reclamation (Reclamation) and the San Luis & Delta-Mendota Water Authority (SLDMWA)

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ABSTRACT

This Long-Term Water Transfers Environmental Impact Statement/Environmental Impact Report (EIS/EIR) evaluates the potential impacts of alternatives to help address Central Valley Project (CVP) water supply shortages. SLDWMA Participating Members and other CVP water contractors in the San Francisco Bay Area experience severe reductions in CVP water supplies during dry hydrologic years. A number of entities upstream from the Sacramento-San Joaquin Delta have expressed interest in transferring water to reduce the effects of CVP shortages to these agencies. The alternatives evaluated in this EIS/EIR include transfers of CVP and non CVP water or transfers from north of the Delta to CVP contractors south of the Delta that require the use of CVP and SWP facilities. Water would be made available for transfer through groundwater substitution, cropland idling, crop shifting, reservoir release, and conservation. This EIS/EIR evaluates potential impacts of water transfers over a 10-year period, 2015 through 2024.

This EIS/EIR has been prepared according to requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). Direct, indirect, and cumulative impacts resulting from the project alternatives on the physical, natural, and socioeconomic environment of the region are addressed.

FOR FURTHER INFORMATION CONTACT:

Brad Hubbard
Bureau of Reclamation
2800 Cottage Way, Sacramento CA 95825
Phone: (916) 978–5204
Email: bhubbard@usbr.gov

Frances Mizuno
San Luis & Delta-Mendota Water Authority
842 6th St, Los Banos CA 93635
Phone: (209) 832-6200
Email: frances.mizuno@sldmwa.org

Executive Summary

Hydrologic conditions, climatic variability, consumptive use within the watershed, and regulatory requirements for operation of water projects commonly affect water supply availability in California. This variability strains water supplies, making advance planning for water shortages necessary and routine. In the past decades, water entities have been implementing water transfers to supplement available water supplies to serve existing demands, and such transfers have become a common tool in water resource planning.

The United States Department of the Interior, Bureau of Reclamation manages the Central Valley Project (CVP), which includes storage in reservoirs (such as Shasta, Folsom, and Trinity reservoirs) and diversion pumps in the Sacramento-San Joaquin Delta (Delta) to deliver water to users in the San Joaquin Valley and San Francisco Bay Area. When these users experience water shortages, they may look to water transfers to help reduce potential impacts of those shortages.

A water transfer involves an agreement between a willing seller and a willing buyer, and available infrastructure capacity to convey water between the two parties. To make water available for transfer, the willing seller must take an action to reduce the consumptive use of water (such as idle cropland or pump groundwater in lieu of using surface water) or release additional water from reservoir storage. This water would be conveyed to the buyers' service area for beneficial use. Water transfers would be used only to help meet existing demands and would not serve any new demands in the buyers' service areas. Pumping capacity at the Delta pumps is generally only available in dry or critically dry years.

Reclamation and the San Luis & Delta-Mendota Water Authority (SLDMWA) are completing a joint Environmental Impact Statement/Environmental Impact Report (EIS/EIR) pursuant to the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) for water transfers from 2015 through 2024. Reclamation is serving as the Lead Agency under NEPA and SLDMWA is the Lead Agency under CEQA. Reclamation would facilitate transfers proposed by buyers and sellers. The SLDMWA, consisting of federal and exchange water service contractors in western San Joaquin Valley, San Benito, and Santa Clara counties, helps negotiate transfers in years when the member agencies could experience shortages.

This EIS/EIR evaluates water transfers that would be purchased by CVP contractors in areas south of the Delta or in the San Francisco Bay Area. The transfers would be conveyed through the Delta using CVP or State Water

Project (SWP) pumps, or facilities owned by other agencies in the San Francisco Bay Area.

This EIS/EIR addresses water transfers to CVP contractors from CVP and non-CVP sources of supply that must be conveyed through the Delta using both CVP, SWP, and local facilities. These transfers require approval from Reclamation and/or the Department of Water Resources (DWR), which necessitates compliance with NEPA and CEQA. Other transfers not included in this EIS/EIR could occur during the same time period, but they would receive separate environmental compliance from the implementing agencies (as necessary).

ES.1 Purpose and Need/Project Objectives

The purpose and need statement (under NEPA) and project objectives (under CEQA) describe the underlying need for and purpose of a proposed project. The purpose and need statement and objectives are a critical part of the environmental review process because they are used to identify the range of reasonable alternatives and focus the scope of analysis.

ES.1.1 Purpose and Need

The purpose of the Proposed Action is to facilitate and approve voluntary water transfers from willing sellers upstream of the Delta to water users south of the Delta and in the San Francisco Bay Area. Water users have the need for immediately implementable and flexible supplemental water supplies to alleviate shortages.

ES.1.2 Project Objectives

SLDMWA has developed the following objectives for long-term water transfers through 2024:

- Develop supplemental water supply for member agencies during times of CVP shortages to meet existing demands.
- Meet the need of member agencies for a water supply that is immediately implementable and flexible and can respond to changes in hydrologic conditions and CVP allocations.

Because shortages are expected due to hydrologic conditions, climatic variability, and regulatory requirements, transfers are needed to meet water demands.

ES.2 Study Area

The Study Area for potential transfers encompasses the potential buyers and sellers that could participate, which are shown in Figure ES-1.

Figure ES-1. Potential sellers would transfer water to buyers in the Central Valley or Bay Area

ES.2.1 Water Agencies Requesting Transfers

Several CVP contractors have identified interest in purchasing transfer water to reduce potential water shortages and have requested to be included in the EIS/EIR; these agencies are shown in Table ES-1.

Table ES-1. Potential Buyers

San Luis & Delta-Mendota Water Authority Participating Members
Byron-Bethany Irrigation District
Del Puerto Water District
Eagle Field Water District
Mercy Springs Water District
Pacheco Water District
Panoche Water District
San Benito County Water District
San Luis Water District
Santa Clara Valley Water District
Westlands Water District
Contra Costa Water District
East Bay Municipal Utility District

ES.2.1.1 SLDMWA

SLDMWA consists of ~~29~~ 28 member agencies representing water service contractors and San Joaquin River Exchange Contractors, but not all SLDMWA member agencies are participating in the proposed activities that are the subject of this EIS/EIR. Reclamation has an operations and maintenance agreement with SLDMWA to operate and maintain the physical works and appurtenances associated with the Jones Pumping Plant, the Delta-Mendota Canal, the O'Neill Pump/Generating Plant, the San Luis Drain, and associated works. One function SLDMWA serves is to help negotiate water transfers with and on behalf of its member agencies when CVP allocations have been reduced and there is a need for supplemental water.

The SLDMWA service area consists primarily of agricultural lands on the west side of the San Joaquin Valley. Agricultural water use occurs on approximately 850,000 irrigated acres. Water for habitat management occurs on approximately 120,000 acres of refuge lands, which receive approximately 250,000 to 300,000 acre-feet (AF) of water per year. Relative to agricultural uses, there is limited municipal and industrial (M&I) water use in the San Joaquin Valley area. The majority of the M&I use in the SLDMWA service area occurs in the San Felipe Division, primarily the Santa Clara Valley Water District (WD).

South-of-Delta agricultural service contractors, many of which are members of the SLDMWA, experience severe cutbacks in CVP allocations in most years. In 2009, deliveries were cut back to ten percent of CVP contract amounts for agricultural water service contracts. In 2014, agricultural service contracts received a zero percent allocation. Note that the Exchange Contractors are not included in these allocations. SLDMWA member agencies use water transfers as a method to supplement water supplies in years when CVP allocations are reduced.

ES.2.1.2 Contra Costa WD

The Contra Costa WD was formed in 1936 to purchase and distribute CVP water for irrigation and industrial uses. Today, the Contra Costa WD encompasses more than 214 square miles, serves a population of approximately 500,000 people in Central and East Contra Costa County, and is Reclamation's largest urban CVP contractor in terms of contract amount.

Contra Costa WD is almost entirely dependent on CVP diversions from the Delta for its water supply. The 48-mile Contra Costa Canal conveys water throughout the service area. Contra Costa WD's long-term CVP contract with Reclamation was renewed in May 2005 and has a term of 40 years. The contract with Reclamation provides for a maximum delivery of 195,000 AF per year from the CVP for M&I purposes, but Contra Costa WD has historically received well below this contract amount. Contra Costa WD also has limited water supply from groundwater, recycled water, and some long-term water purchase agreements.

ES.2.1.3 East Bay Municipal Utility District (MUD)

East Bay MUD was created in 1923 to provide water service to the east San Francisco Bay Area. Today, East Bay MUD provides water and wastewater services to approximately 1.3 million people over a 332 square mile area in Alameda and parts of Contra Costa counties.

Ninety percent of East Bay MUD's water supply comes from the Mokelumne River watershed in the Sierra Nevada. East Bay MUD has a CVP contract with Reclamation to divert water from the Sacramento River for M&I purposes. East Bay MUD's long-term CVP contract with Reclamation was renewed in April 2006 and has a term of 40 years. The contract provides up to 133,000 AF in a single dry year, not to exceed a total of 165,000 AF in three consecutive dry years. CVP water is available to East Bay MUD only in dry years when certain storage conditions within the East Bay MUD system are met (East Bay MUD 2011). As a result East Bay MUD does not forecast frequent use of CVP water.

ES.2.2 Potential Willing Sellers

Table ES-2 lists the agencies that have expressed interest in being a seller in the Long-Term Water Transfers EIS/EIR and the potential maximum quantities available for sale. Actual purchases could be less, depending on hydrology, the amount of water the seller is interested in selling in any particular year, the interest of buyers, and compliance with Central Valley Project Improvement Act (CVPIA) transfer requirements, among other possible factors. Because of the uncertainty of hydrologic and operating conditions in the future, it is likely that only a portion of the potential transfers identified in Table ES-2 would occur.

Table ES-2. Potential Sellers (Upper Limits)

Water Agency	Maximum Potential Transfer
Sacramento River Area of Analysis	
Anderson-Cottonwood Irrigation District	5,225
Conaway Preservation Group	35,000
Cranmore Farms	8,000
Eastside Mutual Water Company	2,230
Glenn-Colusa Irrigation District	91,000
Natomas Central Mutual Water Company	30,000
Pelger Mutual Water Company	3,750
Pleasant Grove-Verona Mutual Water Company	18,000
Reclamation District 108	35,000
Reclamation District 1004	17,175
River Garden Farms	9,000
Sycamore Mutual Water Company	20,000
Te Velde Revocable Family Trust	7,094
American River Area of Analysis	
City of Sacramento	5,000
Placer County Water Agency	47,000
Sacramento County Water Agency	15,000
Sacramento Suburban Water District	30,000
Yuba River Area of Analysis	
Browns Valley Irrigation District	8,100
Cordua Irrigation District	12,000
Feather River Area of Analysis	
Butte Water District	17,000
Garden Highway Mutual Water Company	14,000
Gilsizer Slough Ranch	3,900
Goose Club Farms and Teichert Aggregates	10,000
South Sutter Water District	15,000
Tule Basin Farms	7,320
Merced River Area of Analysis	
Merced Irrigation District	30,000
Delta Region Area of Analysis	
Reclamation District 2068	7,500
Pope Ranch	2,800
Total	*511,094*

ES.3 Development and Screening of Preliminary Alternatives

NEPA and CEQA require an EIS and EIR, respectively, to identify a reasonable range of alternatives and provide guidance on the identification and screening of such alternatives. Both NEPA and CEQA include provisions that alternatives reasonably meet the purpose and need/project objectives, and be potentially feasible. For this EIS/EIR, the Lead Agencies followed a structured, documented process to identify and screen alternatives for inclusion in the EIS/EIR. Figure ES-2 illustrates the process that the Lead Agencies conducted to identify and screen alternatives.

Figure ES-2. Alternatives Development and Screening Process

ES.3.1 Public Scoping and Screening Criteria Results

During public scoping, the public provided input regarding potential alternatives to the Proposed Action. The Lead Agencies reviewed the purpose and need/project objectives statement, public scoping comments, and previous studies in their initial effort to develop conceptual alternatives. This process identified an initial list of measures described in more detail in Appendix A, Alternatives Development Report. The initial list included more than 27 measures. The Lead Agencies then developed and applied a set of screening considerations to determine which measures should move forward for further analysis and be considered as project alternatives.

The Lead Agencies determined that they would screen the alternatives based on their ability to meet key elements of the purpose and need/basic project objectives:

- Immediate: the term proposed for this EIS/EIR is 2015 through 2024. This period is relatively short, and measures need to be able to provide some measurable benefit within this time period.

- Flexible: project participants need water in some years, but not in others. They need measures that have the flexibility to be used only when needed.

- Provide Water: project participants need measures that have the capability of providing additional water to regions that are experiencing shortages.

Measures had to satisfy these key elements in order to move forward to the alternatives formulation phase. Appendix A includes a detailed discussion of the screening process and results.

ES.3.2 Selected Alternatives

The measures that moved forward for more detailed analysis in this EIS/EIR are those that best meet the NEPA purpose and need and CEQA objectives, minimize negative effects, are potentially feasible, and represent a range of reasonable alternatives. Some alternatives do not fully meet the purpose and need/project objectives, but they have potential to minimize some types of environmental effects or help provide a reasonable range of alternatives for consideration by decision-makers.

Measures that were carried forward from scoping and the screening process for alternatives formulation include:

- Agricultural Conservation (Seller Service Area)
- Cropland Idling Transfers - rice, field crops, grains
- Cropland Idling Transfers - alfalfa
- Groundwater Substitution
- Crop Shifting
- Reservoir Release

The measures remaining after the initial screening were combined into three action alternatives that were selected to move forward for analysis in the EIS/EIR (in addition to the No Action/No Project Alternative). Table ES-3 presents the alternatives carried forward for analysis in the EIS/EIR. Analysis of these alternatives will provide the information needed to make a decision, and potentially to mix and match elements of the alternatives, if needed, to create an alternative that would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any significant environmental effects.

Table ES-3. Alternatives Selected for Analysis in the EIS/EIR

Alternative Number	Alternative Name	Description
Alternative 1	No Action/ No Project	The No Action/No Project Alternative represents the state of the environment without the Proposed Action or any of the alternatives. In the No Action/No Project Alternative, the Buyer Service Area would experience water shortages and could increase groundwater pumping, idle cropland, or retire land to address those shortages.
Alternative 2	Full Range of Transfers (Proposed Action)	This alternative combines all potential transfer measures that met the purpose and need and were carried forward through the screening process.
Alternative 3	No Cropland Modifications	The No Cropland Modifications Alternative includes the following measures: • Agricultural conservation (Seller Service Area) • Groundwater substitution • Reservoir release
Alternative 4	No Groundwater Substitution	The No Groundwater Substitution Alternative includes the following measures: • Agricultural conservation (Seller Service Area) • Cropland idling transfers – rice, field crops, grains, alfalfa • Crop shifting • Reservoir release

ES.4 Potential Water Transfer Methods

A water transfer temporarily moves water from a willing seller to a willing buyer. To make water available, the seller must take an action to reduce consumptive use or use water in storage. Water transfers must be consistent with State and Federal law. Transfers involving water diverted through the Delta are governed by existing water rights, applicable Delta pumping limitations, reservoir storage capacity and regulatory requirements.

The biological opinions on the Coordinated Operations of the CVP and SWP (U.S. Fish and Wildlife Service [USFWS] 2008; National Oceanic and Atmospheric Administration Fisheries Service [NOAA Fisheries] 2009) analyze transfers through the Delta from July to September (commonly referred to as the "transfer window") that are up to 600,000 AF in dry and critically dry years and dry years (following dry or critical years). For all other year types, the maximum transfer amount is up to 360,000 AF. Through Delta transfers would be limited to the period when USFWS and NOAA Fisheries find transfers to be acceptable, typically July through September period, unless a change is made in a particular water year based on concurrence from USFWS and NOAA Fisheries.

This EIS/EIR analyzes transfers to CVP contractors. These transfers could be conveyed through the Delta using either CVP or SWP facilities, depending on availability. Some transfers may not involve CVP contractors as sellers, but they may use CVP facilities. Any non-CVP water that would use CVP facilities would need a Warren Act contract, which is subject to NEPA compliance. This document analyzes the impacts of conveying or storing non-CVP water in CVP facilities to address compliance needs for transfers facilitated by execution of a contract pursuant to the Warren Act of February 21, 1911 (36 Stat. 925).

Some transfers may be accomplished through forbearance agreements rather than transfers that involve the State Water Resources Control Board (SWRCB). Under such agreements, a CVP seller would forbear (i.e., temporarily suspend) the diversion of some of their Base Supply, which in the absence of forbearance, would have been diverted for use on lands within the CVP sellers' service areas. This forbearance would be undertaken in a manner that allows Reclamation to deliver the forborne water supply as Project water to a purchasing CVP water agency. A forbearance agreement would not change the way that water is made available for transfer, conveyed to buyers, or used by the buyers; therefore, it would not change the environmental effects of the transfer.

ES.4.1 Groundwater Substitution

Groundwater substitution transfers occur when sellers choose to pump groundwater in lieu of diverting surface water supplies, thereby making the surface water available for transfer. Sellers making water available through groundwater substitution actions are agricultural and M&I users. Water could be made available for transfer by the agricultural users during the irrigation season of April through September. If there are issues related to water supply availability or conveyance capacity at the Delta, sellers could shorten the window when transfer water is available by switching between surface water sources and groundwater pumping for irrigation or M&I use.

Groundwater substitution would temporarily decrease levels in groundwater basins near the participating wells. Water produced from wells initially comes from groundwater storage. Groundwater storage would refill (or "recharge") over time, which affects surface water sources. Groundwater pumping captures some groundwater that would otherwise discharge to streams as baseflow and can also induce recharge from streams. Once pumping ceases, this stream depletion continues, replacing the pumped groundwater slowly over time until the depleted storage fully recharges.

ES.4.2 Reservoir Release

Buyers could acquire water by purchasing surface water stored in reservoirs owned by non-Project entities (not part of the CVP or SWP). To ensure that purchasing this water would not affect downstream users, Reclamation would limit transferred water to what would not have otherwise been released downstream absent the transfer.

When the willing seller releases stored reservoir water for transfer, these reservoirs are drawn down to levels lower than without the water transfer. To refill the reservoir, a seller must capture some flow that would otherwise have gone downstream. Sellers must refill the storage at a time when downstream users would not have otherwise captured the water, either in downstream reservoirs or at the CVP and SWP (collectively “the Projects”) or non-Project pumps in the Delta. Typically, refill can only occur during Delta excess conditions as defined in the “Agreement Between the United States of America and the State of California for Coordinated Operation of the Central Valley Project and State Water Project” (commonly referred to as the “Coordinated Operations Agreement”, or “COA”), as “periods when it is agreed that releases from upstream reservoirs plus unregulated flow exceed Sacramento Valley in basin uses, plus exports,” or when any downstream reservoirs are in flood control operations. Refill of the storage vacated for a transfer may take more than one season to refill if the above conditions are not met in the wet season following the transfer. Each reservoir release transfer would include a refill agreement between the seller and Reclamation (developed in coordination with DWR) to prevent impacts to downstream users following a transfer.

ES.4.3 Cropland Idling

Cropland idling makes water available for transfer that would have been used for agricultural production. Water would be available on the same pattern throughout the growing season as it would have been consumed had a crop been planted. The irrigation season generally lasts from April or May through September for most crops in the Sacramento Valley.

ES.4.4 Crop Shifting

For crop shifting transfers, water is made available when farmers shift from growing a higher water use crop to a lower water use crop. The difference between the water used by the two crops would be the amount of water that can be transferred. Transfer water generated by crop shifting is difficult to account for. Farmers generally rotate between several crops to maintain soil quality, so water agencies may not know what type of crop would have been planted in a given year absent a transfer. To calculate water available from crop shifting, agencies would estimate what would have happened absent a transfer using an average water use over a consecutive 5-year baseline period. The change in consumptive use between this baseline water use and the lower water use crop determines the amount of water available for transfer.

ES.4.5 Conservation

Conservation transfers must include actions to reduce the diversion of surface water by the transferring entity by reducing irrecoverable water losses. The amount of reduction in irrecoverable losses determines the amount of transferrable water. Conservation measures may be implemented on the water-district and individual user scale. These measures must reduce the irrecoverable losses at a site without reducing the amount of water that otherwise would have been available for downstream beneficial uses. Irrecoverable losses include water that would not be usable because it currently flows to a salt sink, to an inaccessible or degraded aquifer, or escapes to the atmosphere.

ES.5 Environmental Consequences/Environmental Impacts

A summary of the environmental impacts identified for the action alternative (including beneficial effects pursuant to NEPA) is presented in Tables ES-4 and ES-5. The No Action/No Project Alternative considers the potential for changed conditions during the 2015-2024 period when transfers could occur, but because this period is relatively short, the analysis did not identify changes from existing conditions. Alternative 1 is therefore not included in the tables.

The purpose of Table ES-4 is to consolidate and disclose the significance determinations made pursuant to CEQA made throughout the EIS/EIR. The impacts listed in Table ES-4 are NEPA impacts as well as CEQA impacts, but they are judged for significance only under CEQA. Pursuant to NEPA, significance is used to determine whether an EIS or some other level of documentation is required, and once the decision to prepare an EIS is made, the magnitude of the impact is evaluated and no further judgment of significance is required. Table ES-5 summarizes impacts for resources that were analyzed only under NEPA and do not include findings of significance.

Table ES-4. Potential Impacts Summary

Potential Impact	Alternative	Significance to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
3.1 Water Supply				
Groundwater substitution transfers could decrease flows in surface water bodies following a transfer while groundwater basins recharge, which could decrease pumping at Jones and Banks Pumping Plants and/or require additional water releases from upstream CVP reservoirs.	2, 3	S	WS-1: Streamflow Depletion Factor	LTS
Water supplies on the rivers downstream of reservoirs could decrease following stored reservoir water transfers, but would be limited by the refill agreements	2, 3, 4	LTS	None	LTS
Changes in Delta diversions could affect Delta water levels ~~and cause local users' diversion pumps to be above the water surface.~~	2, 3, 4	LTS	None	LTS
Transfers would increase water supplies in the Buyers Service Area	2, 3, 4	B	None	B
3.2 Water Quality				
Cropland idling transfers could result in increased deposition of sediment on water bodies.	2, 4	LTS	None	LTS
Cropland idling/shifting transfers could change the water quality constituents associated with leaching and runoff.	2, 4	LTS	None	LTS
Cropland idling/shifting transfers could change the quantity of organic carbon in waterways.	2, 4	LTS	None	LTS
Groundwater substitution transfers could introduce contaminants that could enter surface waters from irrigation return flows.	2, 3	LTS	None	LTS
Water transfers could change reservoir storage in CVP and SWP reservoirs and could result in water quality impacts.	2, 3, 4	LTS	None	LTS

Potential Impact	Alternative	Significance to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Water transfers could change reservoir storage non-Project reservoirs participating in reservoir release transfers, which could result in water quality impacts.	2, 3, 4	LTS	None	LTS
Water transfers could change river flow rates in the Seller Service Area and could affect water quality.	2, 3, 4	LTS	None	LTS
Water transfers could change Delta inflows and could result in water quality impacts.	2, 3, 4	LTS	None	LTS
Water transfers could change Delta outflows and could result in water quality impacts.	2, 3, 4	LTS	None	LTS
Water transfers could change Delta salinity and could result in water quality impacts.	2, 3, 4	LTS	None	LTS
Diversion of transfer water at Banta Carbona ID, West Stanislaus ID, and Patterson ID could affect water quality in the Delta-Mendota Canal.	2, 3, 4	LTS	None	LTS
Use of transfer water in the Buyer Service Area could result in increased irrigation on drainage impaired lands in the Buyer Service Area which could affect water quality.	2, 3, 4	LTS	None	LTS
Water transfers could change reservoir storage in San Luis Reservoir and could result in water quality impacts.	2, 3, 4	LTS	None	LTS
3.3 Groundwater Resources				
Groundwater substitution transfers could cause a reduction in groundwater levels in the Seller Service Area.	2, 3	S	GW-1: Mitigation and Monitoring Plans	LTS
Groundwater substitution transfers could cause subsidence in the Seller Service Area.	2, 3	S	GW-1: Mitigation and Monitoring Plans	LTS

Potential Impact	Alternative	Significance to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Groundwater substitution transfers could cause changes to groundwater quality in the Seller Service Area.	2, 3	LTS	None	LTS
Cropland idling transfers could cause reduction in groundwater levels in the Seller Service Area due to decreased applied water recharge.	2, 4	LTS	None	LTS
Water transfers via cropland idling could cause groundwater level declines in the Seller Service Area that lead to permanent land subsidence or changes in groundwater quality.	2, 4	LTS	None	LTS
Water transfers could reduce groundwater pumping during shortages in the Buyer Service Area, which could increase groundwater levels, decrease subsidence, and improve groundwater quality.	2, 3, 4	B	None	B
3.4 Geology and Soils				
Cropland idling transfers in the Seller Service Area that temporarily convert cropland to bare fields could increase soil erosion.	2, 4	LTS	None	LTS
Cropland idling water transfers could cause expansive soils in the Seller Service Area to shrink due to the reduction in applied irrigation water.	2, 4	LTS	None	LTS
Use of transfer water on agricultural fields in the Buyer Service Area could increase soil erosion.	2, 3, 4	LTS	None	LTS
Use of transfer water on agricultural fields in the Buyer Service Area could increase soil movement.	2, 3, 4	LTS	None	LTS
Changes in streamflows in the Sacramento and San Joaquin Rivers and their tributaries as a result of water transfers could result in increased soil erosion.	2, 3, 4	LTS	None	LTS

Potential Impact	Alternative	Significance to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
3.5 Air Quality				
Increased groundwater pumping for groundwater substitution transfers would increase emissions of air pollutants in the Sellers Service Area.	2, 3	S	AQ-1: Reducing pumping to reduce emissions, AQ-2: Operate electric engines	LTS
Water transfers via cropland idling could reduce vehicle exhaust emissions from reduced operations in the Sellers Service Area.	2, 4	B	None	B
Water transfers via cropland idling would increase fugitive dust emissions from wind erosion of bare fields and decrease fugitive dust emissions associated with land preparation and harvesting in the Sellers Service Area.	2, 4	B	None	B
Use of water from transfers on agricultural fields in the Buyer Service Area could reduce windblown dust.	2, 3, 4	B	None	B
Water transfers via groundwater substitution and cropland idling could exceed the general conformity de minimis thresholds.	2, 3, 4	LTS	None	LTS
3.6 Climate Change				
Increased groundwater pumping for groundwater substitution transfers could increase emissions of greenhouse gases.	2, 3	LTS	None	LTS
Water transfers via cropland idling could reduce vehicle exhaust emissions from reduced operations in the study area.	2, 4	LTS	None	LTS
Changes to the environment from climate change could affect the action alternatives.	2, 3, 4	LTS	None	LTS
Use of water from transfers on agricultural fields in the Buyer Service Area could affect emissions.	2, 3, 4	LTS	None	LTS

Potential Impact	Alternative	Significance to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
3.7 ~~Aquatic Resources~~Fisheries				
Transfer actions could affect reservoir storage and reservoir surface area in reservoirs supporting fisheries resources	2, 3, 4	LTS	None	LTS
Groundwater substitution could reduce stream flows supporting fisheries resources in small streams	2, 3	LTS	None	LTS
Transfer actions could ~~decrease~~ alter flows of rivers and creeks supporting fisheries resources in the Sacramento and San Joaquin river watersheds	2, 3, 4	LTS	None	LTS
Transfer actions could alter hydrologic conditions in the Delta, altering associated habitat availability and suitability	2, 3, 4	LTS	None	LTS
Transfer actions could affect the habitat of special-status species associated with mainstem rivers, tributaries, and the Delta.	2, 3, 4	LTS	None	LTS
3.8 Vegetation and Wildlife				
Groundwater substitution could reduce groundwater levels and available groundwater for~~supporting~~ natural communities	2, 3	LTS	None	LTS
Transfers could impact reservoir storage and reservoir surface area and alter habitat availability and suitability associated with those reservoirs	2, 3, 4	LTS	None	LTS
Groundwater substitution could reduce stream flows supporting natural communities in small streams	2, 3	S	GW-1	LTS
Cropland Idling/shifting could alter habitat availability and suitability for upland species	2, 4	LTS	None	LTS

Potential Impact	Alternative	Significance to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Transfers could reduce flows in large rivers in the Sacramento and San Joaquin River watersheds, altering habitat availability and suitability associated with these rivers	2, 3, 4	LTS	None	LTS
Transfer actions could alter hydrologic conditions in the Delta, altering associated habitat availability and suitability	2, 3, 4	LTS	None	LTS
Transfer actions could impact San Luis Reservoir storage and surface area.	2, 3, 4	LTS	None	LTS
Cropland idling/shifting under could alter the amount of suitable habitat for natural communities and , special-status wildlife species, and migratory birds associated with seasonally flooded agriculture and associated irrigation waterways	2, 4	LTS	None	LTS
Transfer actions could alter planting patterns and urban water use in the Buyer Service Area	2, 3, 4	LTS	None	LTS
Transfers could affect wetlands that provide habitat for special status plant species.	2, 3, 4	LTS	None	LTS
Transfers could affect giant garter snake and Pacific pond turtle by reducing aquatic habitat.	2, 3, 4	LTS	None	LTS
Transfers could affect the San Joaquin kit fox by reducing available habitat.	2, 3, 4	LTS	None	LTS
Transfers could impact special status bird species and migratory birds.	2, 3, 4	LTS	None	LTS
3.9 Agricultural Land Use				
Cropland idling water transfers could permanently or substantially decrease the amount of lands categorized as Prime Farmland, Farmland of Statewide Importance, or Unique Farmland under the FMMP.	2	LTS	None	LTS

Potential Impact	Alternative	Significance to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
	4	S	Mitigation Measure LU-1: Avoiding changes in FMMP land use classifications	LTS
Cropland idling water transfers could convert agricultural lands under the Williamson Act and other land resource programs to an incompatible use.	2, 4	LTS	None	LTS
Cropland idling water transfers could conflict with local land use policies.	2, 4	NI	None	NI
Water transfers could provide water to irrigators in the Buyer Service Area to irrigate existing crop fields and maintain agricultural land uses.	2, 3, 4	B	B	B
3.13 Cultural Resources				
Transfers that draw down reservoir surface elevations beyond historically low levels could result in a potentially significant effect on cultural resources.	2, 3, 4	LTS	None	LTS
Stored reservoir release transfers that draw down reservoir surface elevations at local reservoirs beyond historically low levels could affect cultural resources.	2, 3, 4	LTS	None	LTS
3.14 Visual Resources				
Water transfers could degrade the existing landscape character or scenic attractiveness of Class A and B visual resources at CVP and SWP reservoirs	2, 3, 4	LTS	None	LTS
Water transfers could degrade the existing landscape character or scenic quality of Class A and B visual resources along surface water bodies	2, 3, 4	LTS	None	LTS
Stored reservoir release transfers could substantially degrade the existing landscape character or scenic attractiveness of Class A and B visual resources participating reservoirs	2, 3, 4	LTS	None	LTS

Potential Impact	Alternative	Significance to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Cropland idling transfers could substantially degrade the existing landscape character and scenic attractiveness of Class A and B visual resources	2, 4	LTS	None	LTS
Water transfers could substantially degrade the existing landscape character and quality in the Buyer's Service Area	2, 3, 4	LTS	None	LTS
3.15 Recreation				
Changes in surface water elevation at Shasta, Folsom, Merle Collins, Oroville, Camp Far West, and Lake McClure reservoirs as a result of water transfers could affect reservoir-based recreation.	2, 3, 4	LTS	None	LTS
Changes in surface water elevations at Hell Hole and French Meadows Reservoirs as a result of water transfers could affect reservoir-based recreation.	2, 3, 4	LTS	None	LTS
Changes in river flows from water transfers could affect river-based recreation on the Sacramento, Yuba, Feather, American, San Joaquin, and Merced rivers.	2, 3, 4	LTS	None	LTS
Changes in average flow into the Delta from the San Joaquin River from water transfers could affect river-based recreation.	2, 3, 4	NI	None	NI
Changes in surface water elevation at San Luis Reservoir as a result of water transfers could affect reservoir-based recreation	2, 3, 4	NI	None	NI
3.16 Power				
Acquisition of water via groundwater substitution or crop idling may cause changes in power generation from CVP and SWP reservoirs	2, 3, 4	LTS	None	LTS

Potential Impact	Alternative	Significance to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Acquisition of water via stored reservoir water may cause changes in power generation from the facilities that ~~sell~~ provide water	2, 3, 4	LTS	None	LTS
3.17 Flood Control				
Water transfers would change storage levels in CVP and SWP reservoirs, potentially affecting flood control	2, 3, 4	LTS	None	LTS
Water transfers ~~could~~ would ~~decrease~~ change storage levels in non-Project reservoirs and potentially affecting flood control	2, 3, 4	B	None	B
Water transfers could ~~change~~ increase river flows, potentially affecting flood capacity or levee stability	2, 3, 4	LTS	None	LTS
Water transfers would change storage at San Luis Reservoir, potentially affecting flood control	2, 3, 4	LTS	None	LTS

Key:
B = beneficial
LTS = less than significant
NI = no impact
None = no feasible mitigation identified and/or required
S = significant

Table ES-5. Impacts for NEPA-Only Resources

Potential Impact	Alternative	Impact
3.10 Regional Economics		
Seller Service Area		
Revenues from cropland idling water transfers could increase incomes for farmers or landowners selling water.	2, 4	Beneficial
Cropland idling transfers in Glenn, Colusa, and Yolo counties could reduce employment, labor income, and economic output for businesses and households linked to agricultural activities.	2, 4	Employment: -492 Labor Income: -$19.38 Million Output: -$90.43 Million
Cropland idling transfers in Sutter and Butte counties could reduce economic output, value added, and employment for businesses and households linked to agricultural activities.	2, 4	Employment: -163 Labor Income: -$5.50 Million Output: -$26.76 Million
Cropland idling transfers in Solano County could reduce economic output, labor income, and employment for businesses and households linked to agricultural activities.	2, 4	Employment: -32 Labor Income: -$1.13 Million Output: -$4.58 Million
Cropland idling transfers could have adverse local economic effects.	2, 4	Adverse
Water transfers from idling alfalfa could increase costs for dairy and other livestock feed.	2, 4	Adverse, but minimal
Cropland idling transfers could decrease net revenues to tenant farmers whose landowners choose to participate in transfers.	2, 4	Adverse
Crop shifting transfers could change economic output, value added, and employment for businesses and households linked to agricultural activities.	2, 4	Adverse, but minimal
Crop shifting transfers could change economic output, value added, and employment for businesses and households linked to agricultural activities.	2, 4	Adverse, but minimal
Economic effects associated with cropland idling could conflict with economic policies and objectives set forth in local plans.	2, 4	Adverse
Economic effects associated with cropland idling could conflict with economic policies and objectives set forth in local plans.	2, 4	Adverse
Reductions in local sales associated with cropland idling transfer effects could reduce tax revenues and increase costs to county governments.	2, 4	Adverse, but minimal
Groundwater substitution transfers could increase groundwater pumping costs for water users in areas where groundwater levels decline as a result of the transfer.	2, 3	Adverse
Revenues from groundwater substitution water transfers could increase incomes for farmers or landowners selling water.	2, 3	Beneficial
Groundwater substitution water transfers could increase management costs for local water districts.	2, 3	Adverse
Revenues received from stored reservoir and conservation transfers could increase operating incomes for sellers.	2, 3, 4	Beneficial, but minimal

Potential Impact	Alternative	Impact
Buyer Service Area		
Water transfers would provide water for agricultural uses that could support revenues, economic output, and employment.	2, 3, 4	Beneficial
Water transfers would provide water for M&I uses that could support revenues, economic output, and employment.	2, 3, 4	Beneficial
3.11 Environmental Justice		
Cropland idling transfers could adversely and disproportionately affect minority and low-income farm workers in the Seller Service Area.	2, 4	No disproportionately high or adverse effect
Crop shifting transfers could adversely and disproportionately affect minority and low-income farm workers in the Seller Service Area.	2, 3	No disproportionately high or adverse effect
Use of cropland modification transfers could adversely and disproportionately affect minority and low-income farm workers in the Buyer Service Area.	2, 3, 4	Beneficial
3.12 Indian Trust Assets		
Groundwater substitution transfers could adversely affect ITAs by decreasing groundwater levels, which would potentially interfere with the exercise of a federally-reserved water right use, occupancy, and or character	2, 3	No effect
Groundwater substitution transfers could adversely affect ITAs by reducing the health of tribal members by decreasing water supplies	2, 3	No effect
Groundwater substitution transfers could affect ITAs by affecting fish and wildlife where there is a federally-reserved hunting, gathering, or fishing right.	2, 3	No effect
Groundwater substitution transfers could adversely affect ITAs by causing changes in stream flow temperatures or stream depletion, which would potentially interfere with the exercise of a federally-reserved Indian right	2, 3	No effect
Use of groundwater substitution transfers could affect reservations or Rancherias in the Buyer Service Area to reduce CVP shortages.	2, 3, 4	Beneficial

ES.56 Growth Inducing Impacts

Water proposed for transfer would be transferred from willing sellers to buyers to meet existing demands when there are shortages in Central Valley Project supplies. The proposed water transfers would not directly or indirectly affect growth beyond what is already planned. The term proposed for the transfers under the Proposed Action is 10 years beginning in 2015. The Proposed Action would not induce development growth or remove a barrier for growth because it is not a reliable source of water that could be used to approve development projects by local agencies. Therefore, the Proposed Action would have no growth inducing impacts.

ES.67 References

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Figures

Appendices

Abbreviations and Acronyms

$\mu g/m^3$	micrograms per cubic meter
AB	Assembly Bill
ac	acre
AD	Anno Domini
AF	acre-feet
AG	Agriculture
AP	Agricultural Preserve
AP-42	Compilation of Air Pollutant Emission Factors
APCD	Air Pollution Control District
AQMD	Air Quality Management District
ARBCA	American River Basin Cooperating Agencies
ARBCUP	American River Basin Regional Conjunctive Use Program
ARPA	Archaeological Resources Protection Act
ASIPs	action specific implementation plans
ATCM	Airborne Toxic Control Measure
ATV	all-terrain vehicle
BA	biological assessment
BAMM	Best Available Mitigation Measures
BARDP	Bay Area Regional Desalination Project
BC	Before Christ
BCC	birds of conservation concern
BDCP	Bay-Delta Conservation Plan
bgs	below ground surface
bhp	brake-horsepower
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMO	basin management objective
BMPs	best management practices
BO	Biological Opinion
BRCP	Butte Regional Conservation Plan
CA	California Aqueduct
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
Cal/EPA	California Environmental Protection Agency
CALFED	State (CAL) and Federal (FED) agencies participating in the Bay-Delta Accord

Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCAA	California Clean Air Act
CCCC	California Climate Change Center
CCR	California Code of Regulations
CCSM	Community Climate System Model
CDFA	California Department of Food and Agriculture
CDFG	California Department of Fish and Game (currently the California Department of Fish and Wildlife)
CDFW	California Department of Fish and Wildlife
CDPH	California Department of Public Health
CDPR	California Department of Parks and Recreation
CEC	California Energy Commission
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFCP	California Farmland Conservancy Program
CFR	Code of Federal Regulations
cfs	cubic feet per second
CH_4	methane
cm	centimeters
cm/s	centimeters per second
CNDDB	California Natural Diversity Database
CNPPA	California Native Plant Protection Act
CNPS	California Native Plant Society
CNRM	Centre National de Recherches Meteorologiques
CO	carbon monoxide
CO	Conservation
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
COA	Coordinated Operation Agreement
CPRR	Central Pacific Railroad
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Resources
CRP	Conservation Reserve Program
CSHMS	California Scenic Highway Mapping System
CV	Central Valley
CVHM	Central Valley Hydrologic Model

CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CV-SALTS	Central Valley Salinity Alternatives for Long-Term Sustainability
CWA	Clean Water Act
CWHR	California Wildlife Habitat Relationships
CWSRA	California Wild and Scenic Rivers Act
DDT	dichlorodiphenyltrichloroethane
Delta	Sacramento-San Joaquin Delta
DEM	digital elevation model
DLRP	Division of Land Resource Protection
DMC	Delta-Mendota Canal
DOC	Department of Conservation
DOI	Department of the Interior
DPM	diesel particulate matter
DPS	Distinct Population Segment
DWR	Department of Water Resources
EA	Environmental Assessment
EC	electrical conductivity
EDD	Employment Development Department
eGRID	Emissions & Generation Resource Integrated Database
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EIS/EIR	Environmental Impact Statement/Environmental Impact Report
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
ETAW	evapotranspiration of applied water
EWA	Environmental Water Account
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FMMP	Farmland Mapping and Monitoring Program
FONSI	Finding of No Significant Impact
FORTRAN	Formula Translating System programming language
FR	Federal Register
FSZ	Farmland Security Zone
FWCA	Fish and Wildlife Coordination Act
GAMA	Groundwater Ambient Monitoring and Assessment
GAMAQI	Guide for Assessing and Mitigating Air Quality Impacts

GCM	global climate model
GFDL	Geophysical Fluids Dynamics Laboratory
GHG	greenhouse gas
GIS	geographic information system
GMP	Groundwater Management Plan
GPS	Global Positioning System
GWP	global warming potential
HCP	Habitat Conservation Plan
hp	horsepower
ID	Irrigation District
IMPLAN	IMpact analysis for PLANning
InSAR	Interferometric Sythetic Aperture Radar
IO	input-output
IPCC	Intergovernmental Panel on Climate Change
IPR	indirect potable reuse
ITAs	Indian Trust Assets
km	kilometer
lbs/day	pounds per day
LOD	Level of Development
LU	Land Use
M&I	municipal and industrial
m/d	meters per day
MBTA	Migratory Bird Treaty Act
MCL	maximum contaminant level
MFP	Middle Fork Project
mg/L	milligrams per liter
MicroFEM	finite-element program for multiple-aquifer steady-state and transient groundwater flow modeling
MIG	Minnesota Implan Group
MSCS	Multi-Species Conservation Strategy
MT/yr	metric tons per year
$MTCO_2e$/yr	metric tons carbon dioxide equivalent per year
MUD	Municipal Utility District
MW	megawatts
MWC	Mutual Water Company
n.d.	no date
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards

NAGPRA	Native American Graves Protection and Repatriation Act
NASS	National Agricultural Statistics Service
NBHCP	Natomas Basin Habitat Conservation Plan
NCAR	National Center for Atmospheric Research
NCCP	Natural Community Conservation Plan
NCCPA	Natural Community Conservation Planning Act
NEPA	National Environmental Policy Act
NF	National Forest
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NOAA Fisheries	National Oceanic and Atmospheric Administration Fisheries Service
NOx	nitrogen oxides
NPS	National Park Service
NRA	National Recreation Area
NRCS	Natural Resources Conservation Service
NRDC	Natural Resources Defense Council
NRHP	National Register of Historic Places
NRP	Natural Resources Policy
NSV IRWMP	Northern Sacramento Valley Integrated Regional Water Management Plan
NWR	national wildlife refuge
NWSRA	National Wild and Scenic Rivers Act
NWSRS	National Wild and Scenic Rivers System
O_3	ozone
OAIT	Office of American Indian Trust
OPR	Office of Planning and Research
Pb	lead
PCBs	polychlorinated biphenyls
PCCP	Placer County Conservation Plan
PCM	Parallel Climate Model
PEIS/EIR	Programmatic Environmental Impact Statement/Environmental Impact Report
PG&E	Pacific Gas and Electric Company
PM_{10}	inhalable particulate matter with an aerodynamic diameter less than or equal to 10 microns
$PM_{2.5}$	fine particulate matter with an aerodynamic diameter less than or equal to 2.5 microns

ppb	parts per billion
ppm	parts per million
PRBO	Point Reyes Bird Observatory
PRC	Public Resources Code
PRISM	Parameter-elevation Relationships on Independent Slopes Model
PSD	prevention of significant deterioration
RD	Reclamation District
Reclamation	U.S. Department of the Interior, Bureau of Reclamation
ROD	Record of Decision
ROG	reactive organic gas
RPA	Reasonable and Prudent Alternative
RPR	Rare Plant Rank
RWA	Regional Water Authority
RWQCB	Regional Water Quality Control Board
RWQCBCV	Regional Water Quality Control Board, Central Valley
SACFEM	Sacramento Valley Groundwater Model
SACFEM2013	Sacramento Valley Finite Element Groundwater Model
SacIGSM	Sacramento County Integrated Groundwater and Surface Water Model
SB	Senate Bill
SCV	Santa Clara Valley
SDWA	Safe Drinking Water Act
SGA	Sacramento Groundwater Authority
SIP	state implementation plan
SJMSCP	San Joaquin County Multi-Species Habitat Conservation and Open Space Plan
SJRRP	San Joaquin River Restoration Program
SLDMWA	San Luis & Delta-Mendota Water Authority
SMS	Scenery Management System
SMSHCP	Solano Multispecies Habitat Conservation Plan
SO_2	sulfur dioxide
SOI	sphere of influence
SOx	sulfur oxides
SR	State Route
SRA	State Recreation Area
SSC	Species of Special Concern
SSHCP	South Sacramento Habitat Conservation Plan
SVRR	Sacramento Valley Railroad

SWP	State Water Project
SWRCB	State Water Resources Control Board
TAF	thousand acre-feet
TCR	The Climate Registry
TDS	total dissolved solids
TMDL	Total Maximum Daily Load
TOM	Transfer Operations Model
tpy	tons per year
UCCE	University of California Cooperative Extension
UGB	urban growth boundary
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UWMP	Urban Water Management Plan
VOC	volatile organic compound
WaterSMART	Sustain and Manage America's Resources for Tomorrow
WC	Water Code
WD	Water District
WFA	Water Forum Agreement
WQCP	Water Quality Control Plan
WSP	Water Shortage Policy
WUE	water use efficiency
WY	water year
YNHP	Yolo Natural Heritage Program
µS/cm	microsiemen per centimeter

Chapter 1 Introduction

Hydrologic conditions, climatic variability, consumptive use within the watershed, and regulatory requirements for operation of water projects commonly affect water supply availability in California. This variability strains water supplies, making advance planning for water shortages necessary and routine. In the past decades, water entities have been implementing water transfers to supplement available water supplies to serve existing demands and transfers have become a common tool in water resource planning.

The United States Department of the Interior, Bureau of Reclamation manages the Central Valley Project (CVP), which includes storage in reservoirs (such as Shasta, Folsom, and Trinity reservoirs) and diversion pumps in the Sacramento-San Joaquin Delta (Delta) to deliver water to users in the San Joaquin Valley and San Francisco Bay area. When these users experience water shortages, they may look to water transfers to help reduce potential impacts of those shortages.

Transfers are allowed under California State law and under Federal law. Water users have been encouraged to seek alternative sources of water through willing buyers/willing seller agreements. The purpose of this EIS/EIR is to analyze the effects of transfers between listed buyers and sellers which will streamline the environmental review process and make transfers more implementable relative to NEPA and CEQA requirements, especially when hydrologic conditions and available pumping capacity are unknown until right before the transfer season.

A water transfer involves an agreement between a willing seller and a willing buyer, and available infrastructure capacity to convey water between the two parties. To make water available for transfer, the willing seller must take an action to reduce the consumptive use of water (such as idle cropland or pump groundwater in lieu of using surface water) or release additional water from reservoir storage. This water would be conveyed to the buyers' service area for beneficial use. Water transfers would only be used to help meet existing demands and would not serve any new demands in the buyers' service areas.

Reclamation and the San Luis & Delta-Mendota Water Authority (SLDMWA) are completing a joint Environmental Impact Statement/Environmental Impact Report (EIS/EIR), in compliance with the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA), for water transfers from 2015 through 2024. Reclamation is serving as the Lead Agency under NEPA and SLDWMA is the Lead Agency under CEQA. Reclamation would facilitate transfers proposed by buyers and sellers. The SLDMWA, consisting of federal and exchange water service contractors in western San Joaquin

Valley, San Benito, and Santa Clara counties, helps negotiate transfers in years when the member agencies could experience shortages.

This EIS/EIR evaluates the transfer of water transfers ~~that would be~~ purchased by CVP contractors in areas south of the Delta or in the San Francisco Bay Area. The ~~transfers~~ water would be conveyed through the Delta using CVP or State Water Project (SWP) pumps, or facilities owned by other agencies in the San Francisco Bay Area.

This EIS/EIR addresses the transfer of water ~~transfers~~ to CVP contractors from CVP and non-CVP sources of supply that must be conveyed through the Delta using CVP, SWP, and local facilities. These transfers require approval from Reclamation and/or Department of Water Resources (DWR), which necessitates compliance with NEPA and CEQA. Other transfers not included in this EIS/EIR could occur during the same time period, subject to their own environmental review (as necessary). Non-CVP transfers are analyzed in combination with the potential alternatives in the cumulative analysis.

1.1 Purpose and Need/Project Objectives

The purpose and need statement (under NEPA) and project objectives (under CEQA) describe the underlying need for and purpose of a proposed project. The purpose and need statement and objectives are a critical part of the environmental review process because they are used to identify the range of reasonable alternatives and focus the scope of analysis.

1.1.1 Purpose and Need

The purpose of the Proposed Action is to facilitate and approve voluntary water transfers from willing sellers upstream of the Delta to water users south of the Delta and in the San Francisco Bay Area. Water users have the need for immediately implementable and flexible supplemental water supplies to alleviate shortages.

1.1.2 Project Objectives

SLDMWA has developed the following objectives for long-term water transfers through 2024:

- Develop supplemental water supply for member agencies during times of CVP shortages to meet existing demands.
- Meet the need of member agencies for a water supply that is immediately implementable and flexible and can respond to changes in hydrologic conditions and CVP allocations.

Because shortages are expected due to hydrologic conditions, climatic variability, and regulatory requirements, transfers are needed to meet water demands.

1.2 Project Background

1.2.1 Reclamation and the CVP

Reclamation's Mid-Pacific Region is responsible for managing the CVP, which stores and delivers irrigation water to the Sacramento and San Joaquin valleys, water to cities and industries in Sacramento, the San Joaquin Valley, and the east and south Bay Areas. The CVP also delivers water to fish hatcheries and wildlife refuges throughout the Central Valley, and for protection, restoration and enhancement of fish, wildlife, and associated habitats in the Central Valley. Figure 1-1 shows major CVP facilities and the CVP service area.

The CVP has approximately 270 water service contracts. CVP water allocations for agricultural, environmental, municipal and industrial (M&I) users vary based on factors such as hydrology, water rights, reservoir storage, environmental considerations, and operational limitations. Each year Reclamation determines the amount of water that can be delivered to each district and municipality based on conditions for that year. These allocations are expressed as a percentage of the maximum contract volumes of water according to the contracts, or historical use for M&I contractors in a water short year, held between Reclamation and the various water districts, municipalities, and other entities. Reclamation and the CVP contractors recognize that delivery of full contract quantities is not likely to occur every year (in most years). Table 1-1 summarizes CVP allocations, as percentages of C~~c~~ontract ~~amount~~Total, delivered to agricultural and M&I water contractors north and south of the Delta from 2000 through 2014. Water shortages lead to severe water constraints especially in the southern portion of the CVP.

Figure 1-1. Major CVP Facilities and CVP Service Areas

Table 1-1. CVP Water Supply Allocation Percentages 2000 through 2014

Year	Year Type[1]	Irrigation[2]		M&I	
		North of Delta (%)	South of Delta (%)	North of Delta (%)	South of Delta (%)
2000	AN	100	65	100	90
2001	D	60	49	85	77
2002	D	100	70	100	95
2003	AN	100	75	100	100
2004	BN	100	70	100	95
2005	AN	100	90	100	100
2006	W	100	100	100	100
2007	D	100	50	100	75
2008	C	40	40	75	75
2009	D	40	10	100	60
2010	BN	100	45	100	75
2011	W	100	80	100	100
2012	BN	100	40	100	75
2013	D	75	20	100[3]	70
2014	C	0	0	50	50

Source: Reclamation 2014a

Notes:

[1] Based on the Sacramento Valley Water Year Index

[2] Includes water service contracts, does not include Sacramento River Settlement and San Joaquin River Exchange Contractors

[3] In 2013, American River M&I users received 75 percent of contract amount.

Key:

M&I = municipal and industrial
C = Critical
D = Dry
BN = Below Normal
AN = Above Normal
W = Wet

1.2.2 Water Agencies Requesting Transfers

~~Several~~ A number of CVP contractors have identified interest in purchasing transfer water to reduce potential water shortages and have requested to be included in the EIS/EIR. Table 1-2 summarizes all purchasing agencies, further referred to as buyers.

Table 1-2. Potential Buyers

San Luis & Delta-Mendota Water Authority Participating Members
Byron-Bethany Irrigation District
Del Puerto Water District
Eagle Field Water District
Mercy Springs Water District
Pacheco Water District
Panoche Water District
San Benito County Water District
San Luis Water District
Santa Clara Valley Water District
Westlands Water District
Contra Costa Water District
East Bay Municipal Utility District

1.2.2.1 SLDMWA

SLDMWA consists of 28 member agencies representing water service contractors and San Joaquin River Exchange Contractors. Figure 1-2 shows the SLDMWA service area and identifies participating members included in Table 1-2. Not all of SLDMWA member agencies are participating in this EIS/EIR.

Reclamation has an operation~~s~~ and maintenance agreement with SLDMWA to operate and maintain the physical works and appurtenances associated with the Jones Pumping Plant, the Delta-Mendota Canal, the O'Neill Pump/Generating Plant, the San Luis Drain, and associated works. One function SLDMWA serves is to help negotiate water transfers with and on behalf of its member agencies when CVP allocations have been reduced and there is a need for supplemental water.

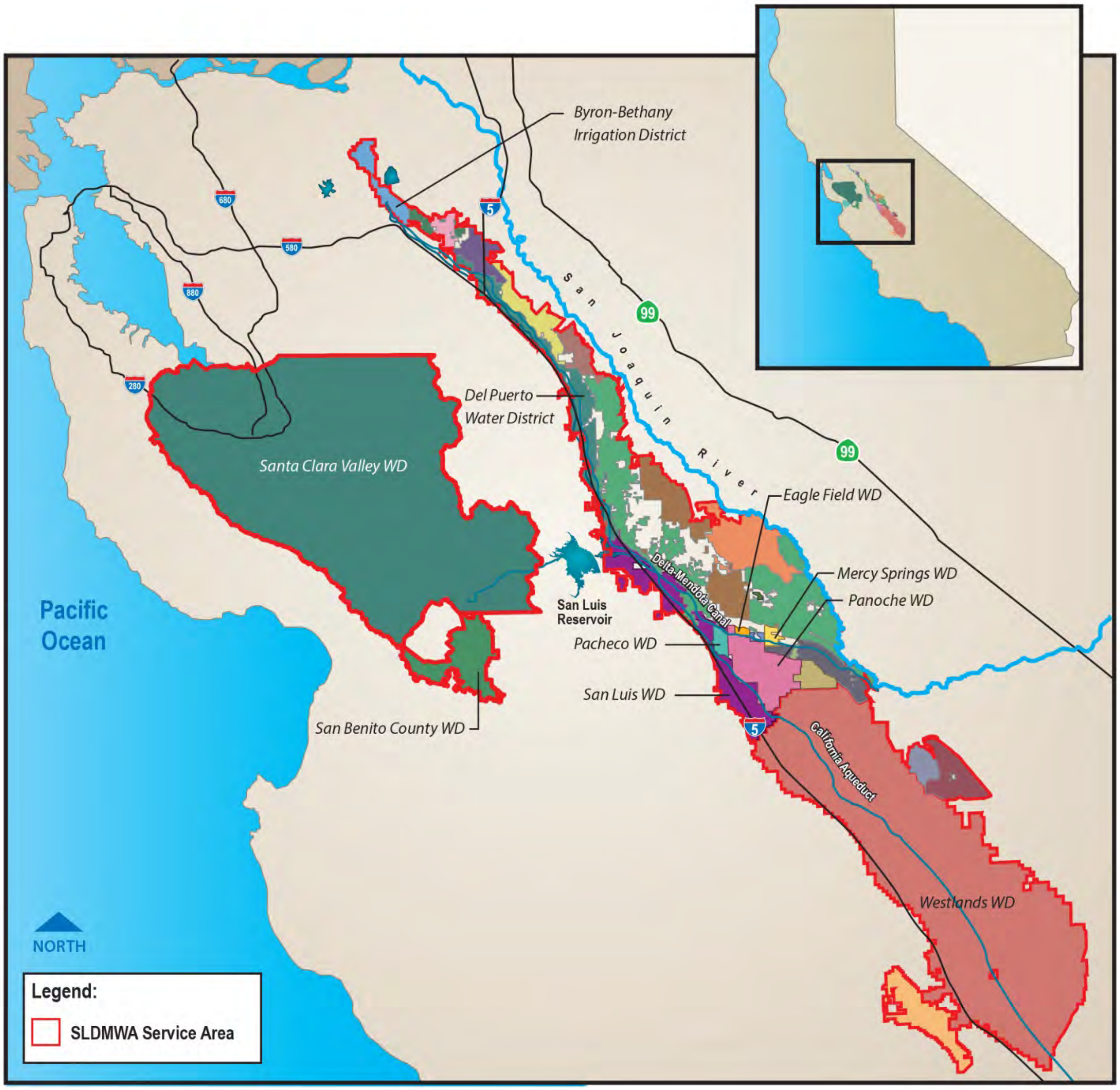

Figure 1-2. SLDWMA Service Area and Participating Member Agencies

The SLDMWA service area consists primarily of agricultural lands on the west side of the San Joaquin Valley. Agricultural water use occurs on approximately 850,000 irrigated acres. Water for habitat management occurs on approximately 120,000 acres of refuge lands, which receive approximately 250,000 to 300,000 acre-feet (AF) of water per year. Relative to agricultural uses, there is limited M&I water use in the San Joaquin Valley area. The majority of the M&I use in the SLDMWA service area occurs in the San Felipe Division, primarily the Santa Clara Valley Water District (WD). From 2001 to 2010, average annual M&I water use in the San Joaquin Valley area was about 22,000 AF and approximately 86,000 AF in the San Felipe Division.

As shown in Table 1-1, south-of-Delta agricultural contractors, many of which are members of the SLDMWA, experience severe cutbacks in CVP allocations in most years. In 2009, deliveries were cut back to ten percent of ~~CVP contract amounts~~Contract Total for agricultural water service contracts. In 2014, agricultural water service contractors received a zero percent allocation. Note that the Exchange Contractors are not included in these allocations. SLDMWA member agencies use water transfers as a method to supplement water supplies in years when CVP allocations are reduced.

1.2.2.2 Contra Costa WD

The Contra Costa WD was formed in 1936 to purchase and distribute CVP water for irrigation and industrial uses. Today, the Contra Costa WD encompasses more than 214 square miles, serves a population of approximately 500,000 people in Central and East Contra Costa County, and is Reclamation's largest urban CVP contractor in terms of ~~contract amount~~Contract Total. Figure 1-3 shows the Contra Costa WD service area.

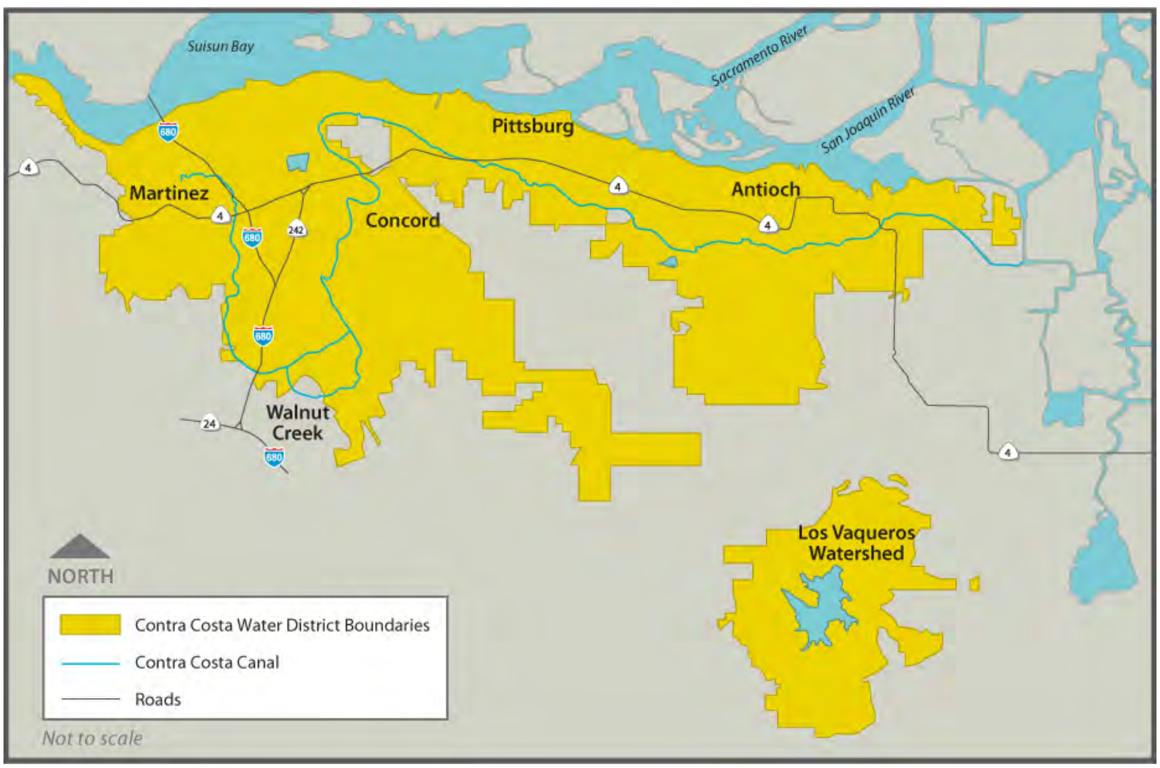

Figure 1-3. Contra Costa WD Service Area

Contra Costa WD is almost entirely dependent on ~~CVP~~ diversions from the Delta. Pursuant to its water service contract with Reclamation, for its water supply. The 48-mile Contra Costa Canal conveys water throughout the service area. Contra Costa WD's long-term CVP contract with Reclamation was renewed in May 2005 and has a term of 40 years. The contract with

Reclamation provides for a ~~maximum delivery~~Contract Total of 195,000 AF per year from the CVP for M&I purposes, with a reduction ~~in deliveries~~ during water shortages including regulatory restrictions and drought. Contra Costa WD also has limited water supply from groundwater, recycled water, and some long-term water purchase agreements.

Figure 1-4 shows ~~historic CVP water deliveries~~Water Delivered to Contra Costa WD for the contract years 2001 through 2010. The figure shows that deliveries are typically well below the ~~contract amount~~Contract Total of 195,000 AF.

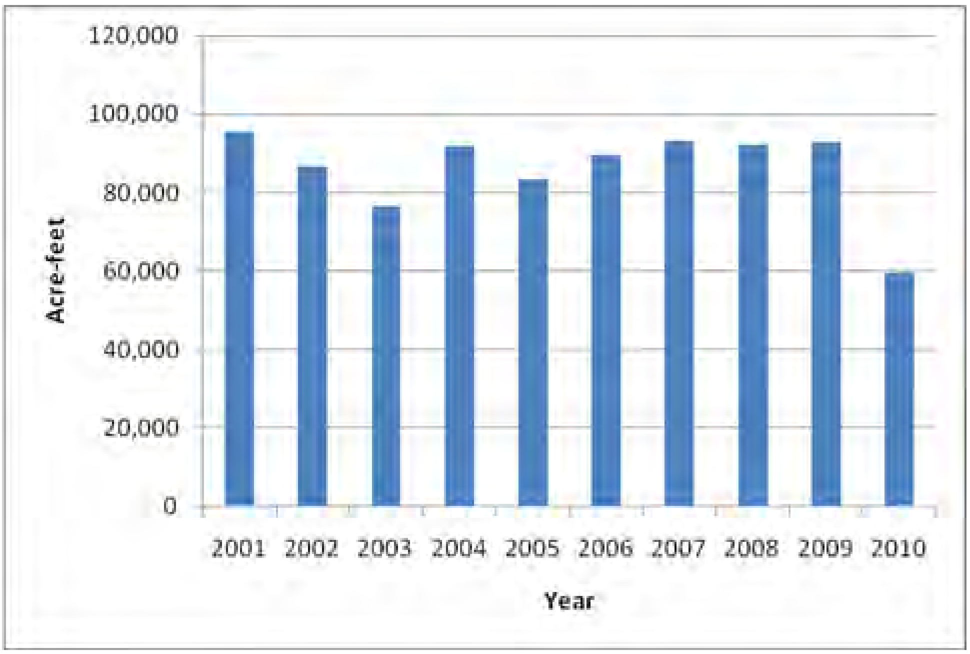

Figure 1-4. ~~Past CVP Deliveries~~Water Delivered to Contra Costa WD, Contract Years 2001-2010

State Water Resources Control Board (SWRCB) Decision 1629 provides that Contra Costa WD may divert water under Permit No. 20749 from Old River to Los Vaqueros Reservoir from November through June during excess conditions in the Delta. Decision 1629 also specifies the maximum diversion rates at 250 cfs and annual diversion to storage (95,800 AF annually at a rate of 200 cfs) by Contra Costa WD to Los Vaqueros Reservoir. These water rights are in addition to Contra Costa WD's CVP (195,000 AF) supply.

In the July 2011 Urban Water Management Plan (UWMP), Contra Costa WD estimates that CVP water supplies in the near term could be reduced from 170,000 AF in a normal year to 127,500 AF in a single year drought and 110,500 AF in the third year of a multi-year drought (Contra Costa WD 2011). The UWMP identifies use of water transfers to bridge the gap between supply and demand. Transfers would assist in meeting demands of existing customers during a drought and compensating them for possible reductions in the availability of CVP supplies (Contra Costa WD 2011).

1.2.2.3 East Bay Municipal Utility District (MUD)

East Bay MUD was ~~created~~ organized in 1923 to provide water service to the east San Francisco Bay Area. Today, East Bay MUD provides water and wastewater services to approximately 1.3 million people over a 332 square mile area in Alameda and parts of Contra Costa counties. Figure 1-5 shows the East Bay MUD service area.

Figure 1-5. East Bay MUD Service Area

Ninety percent of East Bay MUD's water supply comes from the Mokelumne River watershed in the Sierra Nevada. East Bay MUD has a CVP water service contract with Reclamation to divert water from the Sacramento River for M&I purposes. East Bay MUD's long-term CVP contract with Reclamation was renewed in April 2006 and has a term of 40 years. The contract provides up to 133,000 AF in a single dry year, not to exceed a total of 165,000 AF in three consecutive dry years. CVP water is available to East Bay MUD only in dry years when certain storage conditions within the East Bay MUD system are met (East Bay MUD 2011). As a result East Bay MUD does not forecast frequent use of CVP water.

East Bay MUD's 2010 UWMP identifies short-term water transfers originating from northern California as a potential water supply source to meet dry year water supply needs in the future (East Bay MUD 2011).

1.3 Federal and State Regulations Governing Water Transfers

This section discusses federal and state regulations relevant to water transfers. Local ordinances have been adopted in the sellers' service areas that address groundwater-related transfers. These local ordinances are discussed in Section 3.3, Groundwater Resources.

1.3.1 Federal Regulations

1.3.1.1 Central Valley Project Improvement Act (CVPIA) of 1992

The CVPIA[1] is a federal statute passed in 1992 with the following purposes:

> *"To protect, restore, and enhance fish, wildlife, and associated habitats in the Central Valley and Trinity River basins of California; To address impacts of the Central Valley Project on fish, wildlife and associated habitats; To improve the operational flexibility of the Central Valley Project; To increase water-related benefits provided by the Central Valley Project to the State of California through expanded use of voluntary water transfers and improved water conservation; To contribute to the State of California's interim and long-term efforts to protect the San Francisco Bay/Sacramento-San Joaquin Delta Estuary; To achieve a reasonable balance among competing demands for use of Central Valley Project water, including the requirements of fish and wildlife, agricultural, municipal and industrial and power contractors."*

[1] Title 34 of Public Law 102-575, the Reclamation Projects Authorization and Adjustment Act of 1992, signed October 30, 1992.

The CVPIA granted the right to all individuals who receive CVP water (through contracts for water service, repayment contracts, water rights settlements, or exchange contracts) to sell this water to other parties for reasonable and beneficial purposes. According to the CVPIA Section 3405(a), the following principles must be satisfied for any transfer.

- Transfer may not violate the provisions of Federal or state law.
- Transfer may not cause significant adverse effects on Reclamation's ability to deliver CVP water to its contractors.
- Transfer will be limited to water that would be consumptively used or irretrievably lost to beneficial use.
- Transfer will not significantly adversely affect water supplies for fish and wildlife purposes.
- Transfers cannot exceed the average annual quantity of water under contract actually delivered to the contracting district or agency during the last three years of normal water delivery prior to the enactment of the CVPIA.

Reclamation must approve each transfer and will not approve a transfer if it will violate CVPIA principles and other state and federal laws. Reclamation issues its decision regarding potential CVP transfers in coordination with the U.S. Fish and Wildlife Service (USFWS), contingent upon the evaluation of impacts on fish and wildlife. A CVP transfer approval must be accompanied by appropriate documentation under NEPA.

1.3.1.2 Biological Opinions on the Coordinated Operations of the CVP and SWP

On December 15, 2008, USFWS released a biological opinion ~~describing delta smelt protections for the coordinated~~on the effects of coordinated long-term operations of the CVP and SWP on Delta smelt (USFWS 2008). The biological opinion concluded that continued long term operations of the CVP and SWP, as proposed, were "likely to jeopardize" the continued existence of delta smelt without further flow conditions in the Delta for their protection and the protection of designated delta smelt critical habitat. The USFWS developed a Reasonable and Prudent Alternative (RPA) aimed at protecting delta smelt, improving and restoring habitat, and monitoring and reporting results.

Similar to the USFWS biological opinion on delta smelt, National Oceanic Atmospheric Administration Fisheries Service (NOAA Fisheries) released a biological opinion on June 4, 2009 ~~describing the anadromous fish protections for the~~on the effects of continued long term coordinated operations of the CVP and SWP on listed andromous fish (NOAA Fisheries 2009). This biological opinion concluded that continued long term operations of the CVP and SWP, as proposed, were "likely to jeopardize" the continued existence of Sacramento River winter run Chinook salmon, Central Valley spring run Chinook salmon, Central Valley steelhead, and the southern Distinct Population Segment of North American green sturgeon and were "likely to destroy or adversely modify" designated or proposed critical habitat of these species. NOAA Fisheries also concluded that CVP and SWP operation both "directly altered the hydrodynamics of the Sacramento-San Joaquin River basins and have interacted with other activities affecting the Delta to create an altered environment that adversely influences salmonid and green sturgeon population dynamics." The biological opinion identified an RPA to address these issues and protect anadromous fish species.

The Opinions included the following operational parameters applicable to water transfers:

- A maximum amount of water transfers is 600,000 AF per year in ~~dry and~~ critical ~~dry~~ years and dry years (following dry or critical years). For all other year types, the maximum transfer amount is up to 360,000 AF.

- Transfer water will be conveyed through DWR's Harvey O. Banks (Banks) Pumping Plant or Jones Pumping Plant during July through September~~ unless Reclamation and/or DWR consult with the fisheries agencies~~.

Several lawsuits were filed challenging the validity of the 2008 USFWS and 2009 NOAA Fisheries Biological Opinions and Reclamation's acceptance of the RPA included with each (Consolidated Salmonid Cases, Delta Smelt Consolidated Cases). The District Court issued findings that concluded Reclamation had violated NEPA by failing to perform any NEPA analysis before provisionally adopting the 2008 USFWS RPA and 2009 NOAA Fisheries RPA. On December 14, 2010, the District Court found the 2008 USFWS Biological Opinion to be unlawful and remanded the Biological Opinion to USFWS. The District Court issued a similar ruling for the 2009 NOAA Fisheries Biological Opinion on September 20, 2011. On March 13, 2014, the United States Court of Appeals for the Ninth Circuit affirmed in part and reversed in part the finding from the District Court on the USFWS Biological Opinion. The Court of Appeals upheld the determination that Reclamation must complete NEPA analysis, but it reversed ~~the finding that the scientific basis for the Biological Opinion was arbitrary and capricious~~on all arguments related to the adequacy of the Biological Opinion. ~~The NOAA Fisheries Biological Opinion is the subject of a future review from the Court of Appeals~~. On December 22, 2014, the United States Court of Appeals for the Ninth Circuit released similar findings related to the Consolidated Salmonid Cases and reversed the arguments about the adequacy of the Biological Opinion. Reclamation is working to complete NEPA analysis on the Biological Opinions, but ~~Until the legal issues are resolved and new biological opinions are~~

~~completed (if necessary),~~ the 2008 USFWS and 2009 NOAA Fisheries biological opinions will guide operations of potential water transfers.

1.3.2 State Regulations

Several sections of the California Water Code provide the SWRCB with the authority to approve transfers of water involving post-1914 water rights. The Water Code defines processes for short- and long-term water transfers. The SWRCB is responsible for reviewing transfer proposals and issuing petitions for temporary transfers related to post-1914 water rights. The SWRCB generally considers transfers of water under CVP water service or repayment contracts, water rights settlement contracts, or exchange contracts within the CVP place of use authorized in Reclamation's water rights to be internal actions and not subject to SWRCB review. Transfers of CVP water outside of the CVP place of use require SWRCB review and approval. The Water Code includes protections for impacts related to water transfers for other legal users of water, as well as fish, wildlife, and other instream beneficial uses.

Pre-1914 water rights are not subject to SWRCB jurisdiction, but transfers of water involving pre-1914 water rights are subject to review under CEQA and accordingly are analyzed in this EIS/EIR. Transfers involving pre-1914 water rights are also subject to the same "no injury rule" as set forth in Water Code Section 1706. Pre-1914 water rights are not subject to the provisions of the Water Code discussed below unless specifically mentioned.

1.3.2.1 Short-Term Transfers

Short-term (i.e., temporary) transfers are those that take place over a period of one year or less. Water Code Section 1725 allows a permittee or licensee to temporarily change a point of diversion, place of use, or purpose of use of water due to a transfer of water. Short-term transfers under Section 1725 are limited to water that would have been used consumptively or stored absent the water transfer. Section 1725 defines consumptively used water as "the amount of water which has been consumed through use by evapotranspiration, has percolated underground, or has been otherwise removed from use in the downstream water supply as a result of direct diversion." Return flows (water that returns to a stream or a useable underground aquifer after being applied to land) are typically used by other users; therefore, they are generally not available for transfer because the transfer of this water could injure these downstream users. The most common ways to reduce consumptive use are to idle land, shift to less water-intensive crops, or substitute groundwater in-lieu of surface water.

Section 1725 allows expedited processing of short-term transfers of post-1914 water rights. Short-term transfers qualify for this expedited process because the action is limited to one year, minimizing the risk of potential impacts. Transfers qualified under Section 1725 are exempt from CEQA pursuant to Section 1729 of the Water Code; the Water Code relies on notice to the affected parties and findings made by the SWRCB rather than the development of environmental documents under CEQA.

Short-term transfers must not injure any legal user of water or unreasonably affect fish, wildlife, or instream uses. Petitions for transfer must document the identifying permit or license as the basis for the transfer and support the claims of no injury to any legal user of the water and no unreasonable effects to fish and wildlife or other instream beneficial uses. The petition is publicly noticed and persons may file with the SWRCB objections or comments to the petition. The SWRCB is required to act upon the petition in accordance with the procedures set forth in Water Code Section 1726.

Water Code Section 1728 specifies that the one-year transfer period does not include any time required for monitoring, reporting, or mitigation before or after the temporary change is carried out. If, within a period of one year or less, the water is transferred to off-stream storage outside of the watershed where it was originated, the water may be put to beneficial use in the place of use during or after that period.

1.3.2.2 Long-Term Transfers

Long-term transfers are those that take place over a period of more than one year. Long-term transfers of water under post-1914 water rights are governed under Section 1735 of the Water Code. Long-term transfers need not necessarily involve the amount of water consumptively used or stored, but the transfers are evaluated to assure that they will not cause substantial injury to any legal user of water and will not unreasonably affect fish, wildlife, or other instream beneficial uses. The Water Code does not provide for the expedited processing of long-term transfer petitions that is provided for short-term transfer petitions. Long-term transfers under Section 1735 are subject to the requirements of CEQA and must also comply with the standard SWRCB public noticing and protest process. If valid protests to the proposed change cannot be resolved through negotiation between the parties, a hearing must be held prior to the SWRCB's decision on the requested transfer. Section 1745.07 specifically indicates that transfers approved pursuant to provisions of law are deemed to be a beneficial use of water and protect the water rights of the seller during the transfer period.

1.3.2.3 No Injury Rule

A change in water rights involving a transfer is subject to the no injury rule. The no injury rule requires that a transfer may not injure other legal users of water. This rule applies to modern water rights through sections 1725 and 1736 of the Water Code and applies to pre-1914 appropriative water rights through Section 1706 of the Water Code. The SWRCB has jurisdiction over changes to post-1914 water rights, and the courts have jurisdiction over any claimed violations of Section 1706.

1.3.2.4 Effects on Fish and Wildlife

Water Code Sections 1725 and 1736 require that the SWRCB make a finding that proposed transfers not result in unreasonable effects on fish and wildlife or other instream beneficial uses prior to approving a change in post-1914 water rights. California Code of Regulations Title 23 section 794 requires the petitioner to 1) provide information identifying any effects of the proposed changes on fish, wildlife, and other instream beneficial uses, and 2) request consultation with CDFW and the Regional Water Quality Control Board regarding potential effects of the proposed changes on water quality, fish, wildlife, and other instream beneficial uses. The petition for change will not be accepted by the SWRCB unless it contains the required information and consultation request. Early communication with CDFW would streamline the consultation process through "up front" coordination regarding assessment of the potential impact to fish and wildlife resources. The SWRCB will use this information in making their finding that proposed transfers do not result in unreasonable impacts on fish and wildlife or other instream beneficial uses.

1.3.2.5 Local Economic Effects

Cropland idling/crop shifting transfers have the potential to affect the overall economy of the county from which the water is being transferred. Parties that depend on farming-related activities can experience decreases in business if land idling becomes extensive. To minimize the socioeconomic effects on local areas, State agencies evaluate transfer proposals to ensure that the provisions of Water Code Section 1745.05(b) are implemented. Water Code Section 1745.05 (b) provides that if the amount of water made available by land fallowing (idling) exceeds 20 percent of the water that would have been applied absent the proposed water transfer, a public hearing by the water supply agency is required. Water supply agencies interested in participating in cropland idling/crop shifting transfers need to be aware of this Water Code section and conduct a public hearing if they propose a transfer in which cropland idling would exceed the 20 percent threshold.

1.4 History of Water Transfers

Water transfers have been a common water resources planning practice in the past decades. The Lead Agencies have participated in transfers through previous programs or agreements. Transfers have included both in-basin and out-of-basin transfers. Out-of-basin transfers often involve movement of water through the Delta. The following sections briefly describe past water transfer programs and their associated environmental documentation.

The water transfers history highlights the complexities of the water transfer approval process. Reclamation, buyers, and sellers spend significant resources to complete environmental documents that cover water transfers for a single year or a few years. Completing this EIS/EIR to cover ten years of transfers will streamline the environmental review process and make transfers more implementable relative to NEPA and CEQA requirements, especially when hydrologic conditions and available pumping capacity are unknown until right before the transfer season. A ten-year document will also help address requests from USFWS for a more comprehensive evaluation of water transfers on biological resources and listed species.

1.4.1 In-Basin Transfers and NEPA/CEQA

In-basin transfers are a routine practice for water agencies that are within the same region. In-basin transfers occur among agencies within both the Sacramento Valley and the San Joaquin Valley. In-basin transfers are generally one-year transfers used to meet irrigation requirements or existing M&I water needs. Water agencies have also transferred water to nearby refuges to meet refuge habitat requirements.

In-basin transfers among CVP contractors require NEPA documentation. Reclamation typically completes Environmental Assessments (EAs) to cover these transfers. In accordance with the CVPIA, Reclamation has evaluated in-basin transfers over a multi-year period to accelerate approval. Most recently in 2010, Reclamation signed two Finding of No Significant Impact (FONSI) statements for accelerated water transfers and exchanges from 2011 through 2015. One FONSI covered transfers between CVP South of Delta Contractors and the other covered transfers between Friant Division and Cross Valley CVP Contractors. Reclamation also issued a FONSI for accelerated water transfers among CVP contractors and wildlife refuges within the Sacramento Valley from April 2010 through February 2015.

Reclamation also worked with the Exchange Contractors to complete an EIS/EIR to examine the environmental impacts of the transfer and exchange of the Exchange Contractors' CVP water (up to 130,000 AF per year for ten years) from 2005 through 2014 (Reclamation 2004). In 2013, Reclamation released a Final EIS/EIR for the transfer of up to 150,000 AF of substitute water from the Exchange Contractors to potential water users over a 25-year timeframe, from 2014-2038 (Reclamation 2013a).

1.4.2 Out-of-Basin Transfers and NEPA/CEQA

Since the late-1980s, use of out-of-basin water transfers to meet water needs during dry years increased on a statewide level. In response to the drought in the early 1990s, Reclamation and DWR sponsored drought-related programs, including the DWR-run Drought Water Bank initiated in 1991 and 1992, to negotiate and facilitate the exchange of water. A series of wet years in the late 1990s reduced the need for transfers.

In 2000, CALFED Record of Decision (ROD) established the Environmental Water Account (EWA) as a management tool to protect Delta fisheries and maintain water supply reliability for the CVP and SWP. The EWA included purchase of water to help meet these objectives. The CALFED ROD defined the EWA as a four-year program. However, with efficient water purchase practices, the program was able to acquire all the required assets for the EWA each year and extend the allocated funding into a seven-year program implemented from 2001 through 2007. During this time, over two million AF of water assets were acquired for the EWA environmental purposes. To meet NEPA/CEQA requirements, Reclamation and DWR developed the 2004 EWA EIS/EIR, which was a comprehensive evaluation of environmental impacts of the EWA through 2007.

In responses to dry conditions in 2009, Reclamation and DWR cooperatively implemented the 2009 Drought Water Bank to support through-Delta transfers. Reclamation completed the 2009 Drought Water Bank EA and FONSI that evaluated CVP-related transfers that occurred under the 2009 Drought Water Bank. Total CVP-related transfers under the program totaled approximately 390,000 AF.

In 2010, Reclamation completed a 2010-2011 Water Transfer Program EA and FONSI that evaluated out-of-basin transfers for 2010 and 2011 contract years (Reclamation 2010). However, because of wetter hydrologic conditions, no CVP-related transfers occurred in 2010 and 2011.

In 2013, Reclamation developed an EA for one-year transfers from sellers in the Sacramento River basin to SLDMWA (Reclamation 2013b). The EA analyzed up to 37,715 AF of groundwater substitution transfers. Approximately 29,217 AF were transferred under actions and approvals addressed and cleared by this environmental document. As a separate action, Contra Costa WD purchased 2,000 AF from Woodbridge Irrigation District (ID) that was conveyed through East Bay MUD's Mokelumne Aqueduct to Contra Costa WD (Woodbridge ID 2013). Reclamation was not involved in this transfer because it did not involve CVP supplies or CVP facilities.

In 2014, Reclamation and SLDMWA completed an EA/Initial Study for one-year transfers from sellers in the Sacramento River Basin (Reclamation 2014b). The document analyzed transfers up to 175,226 AF made available from groundwater substitution or cropland idling. Transfers up to ~~55,000~~74,030 AF ~~have been~~was negotiated, but all of these transfers ~~may~~ were not ~~be~~ moved based on operational limitations. Reclamation also completed environmental documentation on transfers from Contra Costa WD to Alameda County WD (5,000 AF) and Byron-Bethany ID (4,000 AF) (Reclamation 2014c and Reclamation 2014d). Also in 2014, Reclamation completed NEPA documentation on a transfer Placer County Water Agency to East Bay MUD of about 5,000 AF (Reclamation 2014e).

SLDMWA is a common participant in most water transfers and has negotiated water transfers in past years on behalf of the member agencies. SLDMWA member agencies have been identified as a potential buyer in Reclamation's past transfer programs and many have purchased water in previous years. Table 1-3 shows previous quantities of water transfers purchased by SLDMWA member agencies from 2000 through 2014. Most recently, in 2009, SLDMWA member agencies purchased about 170,000 AF of water originating north of the Delta.

Table 1-3. North of Delta Water Transferred to SLDMWA Member Agencies (2000-2014)

Year	Water Transfer Quantity (AF)
2000	No Transfers
2001	No Transfers
2002	8,685
2003	No Transfers
2004	15,600
2005	3,100
2006	No Transfers
2007	3,100
2008	12,195
2009	106,322
2010	No Transfers
2011	No Transfers
2012	No Transfers
2013	66,500
2014	74,030[1]

Source: SLDMWA 2014
[1]SLDMWA 2015

~~Notes:~~
~~[1] 2014 information from SLDMWA 2014. This amount of transfers was negotiated, but all transfers may not be moved through the Delta because of operational restrictions.~~

1.5 Water Transfers Included in the EIS/EIR and Roles of Participating Agencies

The EIS/EIR evaluates out-of-basin water transfers from willing sellers upstream from the Delta to buyers south of the Delta and in the San Francisco Bay Area. Alternatives considered in this EIS/EIR only analyze transfers ~~of~~ to CVP contractors that require use of CVP or SWP facilities. SWP contractors located south of the Delta may also purchase transfer water originating north of the Delta ~~to areas south of the Delta~~. The cumulative analysis evaluates potential SWP transfers, but they are not part of the action alternatives for this EIS/EIR.

Transfers included in this EIS/EIR are not part of a "program." More specifically, Reclamation is not initiating transfers or managing a bank or program to solicit or connect sellers and buyers. Buyers and sellers are responsible for identifying one another, initiating discussions, and negotiating the terms of the transfers, including amount of water for transfer, method to make water available, and price. Buyers and sellers must prepare transfer proposals for submission to Reclamation. The transfer proposals must identify whether the transfers are included in the selected alternative, as well as other required transfer information as defined by Reclamation and appropriate mitigation measures. Proposals must also be submitted to DWR if the transfers require use of DWR facilities or the transfers involve a seller with a settlement agreement with DWR.

Reclamation reviews transfer proposals to ensure they are in accordance with NEPA, CVPIA, and California State law. Reclamation also determines if a Warren Act Contract is appropriate (if non-CVP water would be stored or conveyed through CVP facilities). If a transfer is approved, Reclamation moves the water through CVP facilities at the specified time of transfer to the buyer's service area. DWR may also be involved in conveying water for transfers and is interested in verifying that water made available for transfers does not compromise SWP water supplies. For water conveyed through the SWP system, DWR must also determine if the transfer can be made without injuring any legal user of water and without unreasonably affecting fish, wildlife, or other instream beneficial uses and without unreasonably affecting the overall economy or environment of the county from which the water is being transferred. Because of DWR's role in water transfers, DWR is a Responsible Agency under CEQA for this EIS/EIR.

1.6 Decision to be Made and Uses of this Document

SLDMWA will use this document as the environmental analysis for a decision on whether to implement water transfers through 2024 that must be conveyed through the Delta using CVP or SWP facilities. Reclamation will use this document to decide whether to approve and facilitate water transfers of CVP water supplies or non-CVP supplies that require use of CVP facilities and ensure that water transfers are implemented with measures incorporated to minimize environmental effects. Appendix K provides the Mitigation Monitoring and Reporting Program for the proposed long-term water transfers. Appendix N contains an Index of key terms.

When proposing or approving a specific water transfer in the future, the Lead Agencies will consider whether it was analyzed in this document. If so, the Lead Agencies can rely on the analysis in this document. If it is not covered or there have been significant changes, the Lead Agencies may need to supplement this document.

1.7 Issues of Known Controversy

Federal, State, and local agencies, and other parties have participated in the NEPA and CEQA process leading to the development of the water transfer alternatives presented in this EIS/EIR. During January 2011, public scoping sessions on the development of the Long-Term Water Transfers EIS/EIR were held in Chico, Los Banos, and Sacramento. Key issues raised during the public scoping process that are applicable for inclusion in the EIS/EIR are listed below. The public in the Seller Service Area and not in the Buyer Service Area provided these comments.

- Water transfers could result in long-term impacts to groundwater, by decreasing groundwater levels and adversely affecting groundwater users that are not participating in transfers. The EIS/EIR must evaluate groundwater impacts over the ten-year transfer period.
- The cumulative effects analysis must include all water transfers and programs that result in additional groundwater pumping in the Sacramento Valley region.
- Water transfers could result in impacts to adjacent water users, local economies, and fish and wildlife. The EIS/EIR must evaluate and mitigate water transfer effects to non-transferring parties.

1.8 References

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Chapter 2 Proposed Action and Description of the Alternatives

This chapter includes an overview of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) requirements for development of project alternatives. It also includes a description of the alternatives formulation process to select a reasonable range of alternatives and a description of the Proposed Action/Proposed Project (Proposed Action) and its alternatives.

2.1 NEPA and CEQA Requirements

2.1.1 NEPA Requirements

Federal law outlines the required components of the "alternatives" section of an Environmental Impact Statement (EIS) (40 Code of Federal Regulations [CFR] Part 1502.14), which include the following:

(a) Rigorous exploration and objective evaluation of all reasonable alternatives, and for alternatives which were eliminated from study, a brief discussion of the reasons for their having been eliminated.

(b) Substantial treatment of each alternative considered in detail, including the proposed action, so that reviewers may evaluate their comparative merits.

(c) Inclusion of reasonable alternatives that are not within the jurisdiction of the lead agency.

(d) Inclusion of the alternative of no action.

(e) Identification of the agency's preferred alternative or alternatives, if one or more exists, in the draft statement and identification of such an alternative in the final statement unless another law prohibits the expression of such a preference.

(f) Inclusion of appropriate mitigation measures that are not already included in the proposed action or alternatives.

2.1.2 CEQA Requirements

The CEQA Guidelines[1] developed by the California Natural Resources Agency include prescriptive requirements for the components of the "project description" section of an Environmental Impact Report (EIR). The required components from Section 15124 of the CEQA Guidelines are listed below.

(a) The precise location and boundaries of the proposed project shall be shown on a detailed map, preferably topographic. The location of the project shall also appear on a regional map.

(b) The document will include a statement of objectives sought by the proposed project. A clearly written statement of objectives will help the lead agency develop a reasonable range of alternatives to evaluate in the EIR and will aid the decision-makers in preparing findings or a statement of overriding considerations, if necessary. The statement of objectives should include the underlying purpose of the project.

(c) A general description of the project's technical, economic, and environmental characteristics, considering the principal engineering proposals, if any, and supporting public service facilities.

(d) A statement briefly describing the intended uses of the EIR.

  (1) This statement shall include the following, to the extent that the information is known to the lead agency:

  - A list of the agencies that are expected to use the EIR in their decision-making.
  - A list of permits and other approvals required to implement the project.
  - A list of related environmental review and consultation requirements required by federal, state, or local laws, regulations, or policies. To the fullest extent possible, the lead agency should integrate CEQA review with these related environmental review and consultation requirements.

  (2) If a public agency must make more than one decision on a project, all its decisions subject to CEQA should be listed, preferably in the order in which they occur.

[1] Title 14, California Code of Regulations, §§ 15000–15387.

2.2 Alternatives Development

NEPA and CEQA require an EIS and EIR, respectively, to identify a reasonable range of alternatives and provide guidance on the identification and screening of such alternatives. Both NEPA and CEQA include provisions that alternatives reasonably meet the purpose and need/project objectives, and be potentially feasible. For this EIS/EIR, the Lead Agencies followed a structured, documented process to identify and screen alternatives for inclusion in the EIS/EIR. Figure 2-1 illustrates the process that the Lead Agencies conducted to identify and screen alternatives.

Figure 2-1. Alternatives Development and Screening Process

2.2.1 Public Scoping and Screening Criteria Results

During public scoping, the public provided input regarding potential alternatives to the Proposed Action. The Lead Agencies reviewed the purpose and need/project objectives statement, public scoping comments, and previous studies in their initial effort to develop conceptual alternatives. This process identified an initial list of measures described in more detail in Appendix A, Alternatives Development Report and summarized in Table 2-1. The initial list included more than 27 measures. The Lead Agencies then developed and applied a set of screening considerations to determine which measures should move forward for further analysis and be considered as project alternatives.

The Lead Agencies determined that they would screen the alternatives based on their ability to meet key elements of the purpose and need/basic project objectives:

- Immediate: the term proposed for this EIS/EIR is 2015 through 2024. This period is relatively short, and measures need to be able to provide some measurable benefit within this time period.

- Flexible: project participants need water in some years, but not in others. They need measures that have the flexibility to be used only when needed.

- Provide Water: project participants need measures that have the capability of providing additional water to regions that are experiencing shortages.

Measures had to satisfy these key elements in order to move forward to the alternatives formulation phase. Table 2-1 provides an overview of the original measures developed during scoping and their screening results. Appendix A includes a detailed discussion of the screening process and results.

Table 2-1. Measures Screening Evaluation Results

Measures	Description	Immediate	Flexible	Provides Water
Agricultural conservation (Buyer Service Area)	Increase agricultural conservation in buyer service area to reduce agricultural water use, and improve agricultural systems to increase recapture and reuse of irrigation water	-	X	-
Agricultural conservation (Seller Service Area)	Increase agricultural conservation in seller service area to reduce agricultural water use, and improve agricultural systems to increase recapture and reuse of irrigation water	X	X	X
Conservation – municipal & industrial	Increase water conservation for municipal and industrial uses in Buyer Service Area to reduce water demands	X	X	-
Desalination - brackish	Desalinate brackish groundwater supplies and distribute to Buyer Service Area to develop new supply	-	X	X
Desalination - seawater	Desalinate seawater and distribute to the Buyer Service Area to develop new water supply	-	X	X
Reclamation - nonpotable reuse	Treat wastewater for agricultural water use in the buyer service area	-	X	X
Reclamation - indirect potable reuse	Advance treat wastewater and store in groundwater basins for future potable reuse	-	X	X
Cropland idling transfers- rice, field crops, grains	Idle croplands and transfer irrigation water to buyers	X	X	X
Cropland idling transfers-and alfalfa	Idle alfalfa fields and transfer irrigation water to buyers	X	X	X
Land retirement in San Joaquin Valley	Permanently retire lands in San Joaquin Valley and transfer irrigation water to other croplands	-	-	-
Groundwater substitution	Pump groundwater for irrigation rather than use of surface water supplies and transfer surface water to the buyers service area	X	X	X
New surface storage	Build new surface storage facilities to store water for the buyers	-	X	X
Groundwater storage	Build new facilities to recharge and extract groundwater for use in buyer service area or expand existing groundwater storage programs by increases recharge and extraction facilities	X	X	-
Water rights purchase	Purchase water rights for permanent transfer of water	-	X	-

Measures	Description	Immediate	Flexible	Provides Water
Delta conveyance	Build canal to increase CVP water deliveries south of Delta	-	X	X
Crop shifting in Seller Service Area	Shift from a higher water use crop to a lower water use crop and transfer incremental decrease in water to buyers	X	X	X
Rice decomposition water	Use alternate method to decompose rice straw and transfer rice decomposition water to the buyers	X	X	-
Reservoir release	Transfer available water stored in existing, non-CVP or -SWP reservoirs	X	X	X
Transfers within Buyer Service Area	Implement water transfers from buyers and sellers within the Buyer Service Area	X	X	-
Groundwater development	Develop new groundwater supplies by constructing new wells and pumps in the buyer service area	-	X	-
Modify CVP and SWP contracts	Change CVP and SWP contracts to limit water use in the buyer service area	-	-	-
Change cropping patterns in San Joaquin Valley	Plant lower water use crops or increase fallowed land in the Buyer Service Area	X	X	-
Limit dairies in San Joaquin Valley	Limit dairies in San Joaquin Valley to decrease water use	-	X	-
Enforce seniority system to manage deliveries	Deliver water supplies based on seniority of water rights	-	-	-
Implement policy of no net increase in water availability for urban or agricultural expansion	Prohibit use of CVP supplies for newly developed urban or agricultural lands	-	-	-
Pipe water from Canada and northern states	Purchase water and build distribution system to deliver water from northern states to the buyers	-	X	X
Fix Owens Valley	Increase water supply available from Owens Valley	-	-	-

Key:
CVP – Central Valley Project, SWP – State Water Project

2.2.2 Selected Alternatives

The measures that moved forward for more detailed analysis in this EIS/EIR are those that best meet the NEPA purpose and need and CEQA objectives, minimize negative effects, are potentially feasible, and represent a range of reasonable alternatives. Some alternatives do not fully meet the purpose and need/project objectives, but they have potential to minimize some types of environmental effects or help provide a reasonable range of alternatives for consideration by decision-makers.

Measures that were carried forward from scoping and the screening process for alternatives formulation include:

- Agricultural Conservation (Seller Service Area)
- Cropland Idling Transfers - rice, field crops, grains
- Cropland Idling Transfers - alfalfa

- Groundwater Substitution
- Crop Shifting
- Reservoir Release

The measures remaining after the initial screening were combined into three action alternatives that were selected to move forward for analysis in the EIS/EIR (in addition to the No Action/No Project Alternative). Table 2-2 presents the alternatives carried forward for analysis in the EIS/EIR. Analysis of these alternatives will provide the information needed to make a decision, and potentially to mix and match elements of the alternatives, if needed, to create an alternative that would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any significant environmental effects.

Table 2-2. Alternatives Selected for Analysis in the EIS/EIR

Alternative Number	Alternative Name	Description
Alternative 1	No Action/ No Project	The No Action/No Project Alternative represents the state of the environment without the Proposed Action or any of the alternatives. In the No Action/No Project Alternative, the Buyer Service Area would experience shortages and could increase groundwater pumping, idle cropland, or retire land to address those shortages.
Alternative 2	Full Range of Transfers (Proposed Action)	This alternative combines all potential transfer measures that met the purpose and need and were carried forward through the screening process.
Alternative 3	No Cropland Modifications	The No Cropland Modifications Alternative includes the following measures: • Agricultural conservation (Seller Service Area) • Groundwater substitution • Reservoir release
Alternative 4	No Groundwater Substitution	The No Groundwater Substitution Alternative includes the following measures: • Agricultural conservation (Seller Service Area) • Cropland idling transfers– rice, field, grains, alfalfa • Crop shifting • Reservoir release

2.3 Proposed Action and Alternatives

The following sections describe the alternatives under evaluation in this EIS/EIR.

2.3.1 Alternative 1: No Action/No Project Alternative

The Council on Environmental Quality regulations require an EIS to include a No Action Alternative (40 CFR Section 1502.14). The No Action Alternative may be described as the future circumstances without the proposed action and can also include predictable actions by persons or entities, other than the federal agency involved in a project action, acting in accordance with current management direction or level of management intensity.

CEQA requires an EIR to include a No Project Alternative. The No Project Alternative allows for a comparison between the impacts of the proposed project with future conditions of not approving the proposed project. The No Project Alternative may include some reasonably foreseeable changes in existing conditions and changes that would be reasonably expected to occur in the foreseeable future if the project were not approved.

Under the No Action/No Project Alternative, Central Valley Project (CVP) related water transfers through the Delta would not occur during the period 2015-2024. However, other transfers that do not involve CVP water or facilities could occur under the No Action/No Project Alternative. Additionally, CVP transfers within basins could continue and would still require Reclamation's approval. Some CVP entities may decide that they are interested in selling water to buyers in export areas under the No Action/No Project Alternative; however, they would need to complete individual environmental compliance for each transfer to allow Reclamation to complete the evaluation of the transfers for approval.

Under the No Action/No Project Alternative, some agricultural and urban water users may face potential shortages in the absence of water transfers. To the extent transfer water is not available, there would be demand that would be unmet by surface water. Demand may be met by increasing groundwater pumping, idling cropland, reducing landscape irrigation, land retirement, or rationing water.

2.3.2 Alternative 2: Full Range of Transfer Measures (Proposed Action)

This section describes potential transfer participants, potential transfer methods and operations for Alternative 2. Alternative 2 would involve transfers from potential sellers upstream from the Delta to buyers in the Central Valley or Bay Area (see Figure 2-2) when the Delta is in balanced conditions.

Figure 2-2. Potential sellers would transfer water to buyers in the Central Valley or Bay Area

2.3.2.1 Potential Water Transfer Methods

A water transfer temporarily moves water from a willing seller to a willing buyer. To make water available, the seller must take an action to reduce consumptive use or use water in storage. Water transfers must be consistent with State and Federal law, as discussed in Chapter 1. Transfers involving water diverted through the Delta are governed by existing water rights, applicable Delta pumping limitations, reservoir storage capacity and regulatory requirements.

The biological opinions on the Coordinated Operations of the CVP and State Water Project (SWP) (U.S. Fish and Wildlife Service [USFWS] 2008; National Oceanic and Atmospheric Administration Fisheries Service [NOAA Fisheries] 2009) analyze transfers through the Delta from July to September that are up to 600,000 acre-feet (AF) in critical years and dry ~~and critically dry~~ years (following dry or critical years). For all other year types, the maximum transfer amount is up to 360,000 AF. Through Delta transfers would be limited to the period when USFWS and NOAA Fisheries find transfers to be acceptable, typically July through September, unless a change is made in a particular water year based on concurrence from USFWS and NOAA Fisheries. Because this document only analyzes the environmental effects associated with a July through September transfer window, supplemental environmental documentation will be prepared to address the effects of moving the transfer window if such a shift were to occur.

In May 2011 and September 2011, U.S. District Judge Wanger ruled that USFWS and NOAA Fisheries, respectively, must submit new biological opinions on smelt and salmonids. Additionally, he found that Reclamation must complete NEPA before accepting the Reasonable and Prudent Alternatives within the biological opinions. In March 2013, the Ninth Circuit Court of Appeals upheld that Reclamation must complete NEPA, but reversed ~~the previous decision that the scientific basis for the USFWS was arbitrary and capricious. A similar case regarding the NOAA Fisheries biological opinion is before the court~~on all arguments related to the adequacy of the Biological Opinion. On December 22, 2014, the United States Court of Appeals for the Ninth Circuit released similar findings related to the Consolidated Salmonid Cases and reversed the arguments about the adequacy of the Biological Opinion. Reclamation is working to complete NEPA analysis on the Biological Opinions, but the 2008 USFWS and 2009 NOAA Fisheries biological opinions will guide operations of potential water transfers. ~~If new biological opinions are completed, the new biological opinions or the findings of the NEPA analysis could change the quantity or timing of transfers. If the biological opinions alter the timing and quantity of transfers, the Lead Agencies will determine if supplemental environmental documentation is necessary to address any changes in potential impacts.~~

This EIS/EIR analyzes transfers to CVP contractors. These transfers could be conveyed through the Delta using either CVP or SWP facilities, depending on availability. CVP sellers could transfer either Base Supply or Project Water under their CVP contracts. Some transfers may not involve CVP contractors as sellers, but they may use CVP facilities. Any non-CVP water that would use CVP facilities would need a Warren Act contract, which is subject to NEPA compliance. This document analyzes the impacts of conveying or storing non-CVP water in CVP facilities to address compliance needs for transfers facilitated by execution of a contract pursuant to the Warren Act of February 21, 1911 (36 Stat. 925).

Some transfers may be accomplished through forbearance agreements rather than transfers that involve the State Water Resources Control Board (SWRCB). Under such agreements, a CVP seller would forbear (i.e., temporarily suspend) the diversion of some of their Base Supply, which in the absence of forbearance, would have been diverted for use on lands within the CVP sellers' service areas. This forbearance would be undertaken in a manner that allows Reclamation to deliver the forborne water supply as Project water to a purchasing CVP water agency. A forbearance agreement would not change the way that water is made available for transfer, conveyed to buyers, or used by the buyers; therefore, it would not change the environmental effects of the transfer.

Groundwater Substitution

Groundwater substitution transfers occur when sellers choose to pump groundwater in lieu of diverting surface water supplies, thereby making the surface water available for transfer. Sellers making water available through groundwater substitution actions are agricultural and municipal and industrial users. Water could be made available for transfer by the agricultural users during the irrigation season of April through September. If there are issues related to water supply availability or conveyance capacity at the Delta, sellers could shorten the window when transfer water is available by switching between surface water sources and groundwater pumping for irrigation or municipal and industrial use.

Groundwater substitution would temporarily decrease levels in groundwater basins near the participating wells. Water produced from wells initially comes from groundwater storage. Groundwater storage would refill (or "recharge") over time, which affects surface water sources. Groundwater pumping captures some groundwater that would otherwise discharge to streams as baseflow and can also induce recharge from streams. Once pumping ceases, this stream depletion continues, replacing the pumped groundwater slowly over time until the depleted storage fully recharges.

Reservoir Release

Buyers could acquire water by purchasing surface water stored in reservoirs owned by non-Project entities (not part of the CVP or SWP). To ensure that purchasing this water would not affect downstream users, Reclamation would limit transferred water to what would not have otherwise been released downstream absent the transfer.

When the willing seller releases stored reservoir water for transfer, these reservoirs are drawn down to levels lower than without the water transfer (see Figure 2-3). To refill the reservoir, a seller must capture some flow that would otherwise have gone downstream. Sellers must refill the storage at a time when downstream users would not have otherwise captured the water, either in downstream reservoirs or at the CVP and SWP (collectively "the Projects") or non-Project pumps in the Delta. Typically, refill can only occur during Delta excess conditions as defined by the Coordinated Operations Agreement (COA) as "periods when it is agreed that releases from upstream reservoirs plus unregulated flow exceed Sacramento Valley in basin uses, plus exports," or when any downstream reservoirs are in flood control operations. Additionally, refill cannot occur at times when the water would have been used to meet downstream flow or water quality standards. Refill of the storage vacated for a transfer may take more than one season to refill if the above conditions are not met in the wet season following the transfer. Each reservoir release transfer would include a refill agreement between the seller and Reclamation (developed in coordination with Department of Water Resources [DWR]) to prevent impacts to downstream users following a transfer.

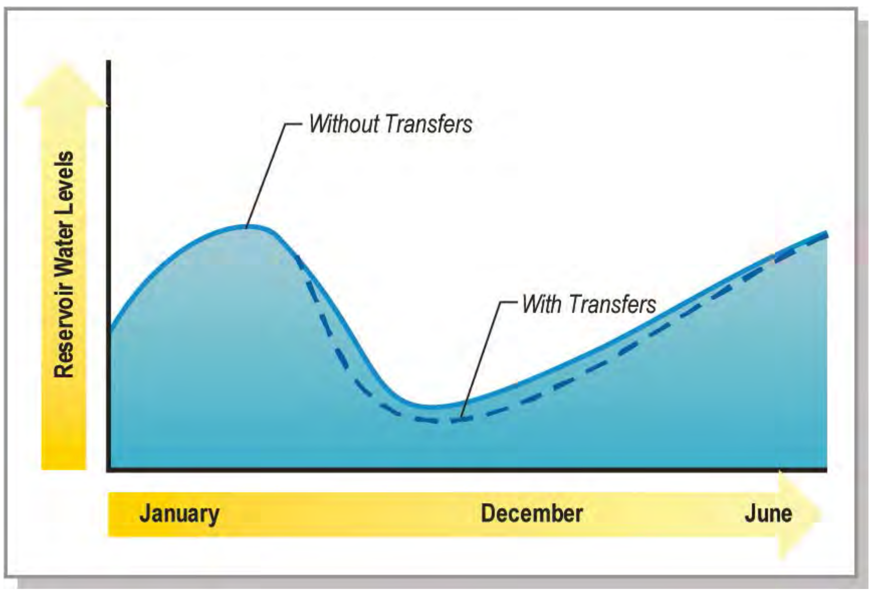

Figure 2-3. Reservoir levels would change because of reservoir release transfers

Some entities that could transfer water through reservoir release are upstream of CVP reservoirs and could request to store water temporarily in the CVP reservoirs. These entities may have restrictions on the patterns that they could release water from their reservoirs, and the patterns may not match the availability of export capacity in the Delta. The seller could request that Reclamation store the non-CVP water in the CVP reservoir until Delta capacity is available, which would require contractual approval in accordance with the Warren Act of 1911. Temporary storage would increase reservoir levels temporarily while water was stored. Reclamation would not release water for transfer from CVP reservoirs before the non-CVP water was available.

Cropland Idling

Cropland idling makes water available for transfer that would have been used for agricultural production. Water would be availab~~water~~le on the same pattern throughout the growing season as it would have been consumed had a crop been planted. The irrigation season generally lasts from April or May through September for most crops in the Sacramento Valley.

The quantity of water made available for transfer through cropland idling would be calculated based on the evapotranspiration of applied water (ETAW). ETAW is the portion of applied surface water that is used by the crop and evaporated from the soil and plant surfaces. Not all crops would be considered for participation in a transfer. Mixed grasses, orchard and vineyard, and alfalfa in the Delta region would not be considered due to factors that make it difficult to determine water savings, such as a lack of authoritative ETAW values and variability in cultural practices. Table 2-3 shows the ETAW of crops currently accepted by Reclamation and DWR that would be potentially involved in transfers. These values were developed using the conceptual model and data in DWR Bulletin 113-3 (DWR 1975).

Table 2-3. Estimated ETAW Values for Various Crops Suitable for Idling or Shifting Transfers

Crop	ETAW (AF/acre)
Alfalfa[1]	1.7 (July – Sept)
Bean	1.5
Corn	1.8
Cotton	2.3
Melon	1.1
Milo	1.6
Onion	1.1
Pumpkin	1.1
Rice	3.3
Sudan Grass	3.0
Sugar Beets	2.5
Sunflower	1.4
Tomato	1.8
Vine Seed/ Cucurbits	1.1
Wild Rice	2.0

Source: Department of Water Resources and Reclamation 2013

Notes:

[1] Only alfalfa grown in the Sacramento Valley floor north of the American River will be allowed for transfers. Fields must be disced on, or prior to, the start of the transfer period. Alfalfa acreage in the foothills or mountain areas is not eligible for transfer.

Consistent with the provisions contained in Water Code Section 1018, potential sellers are encouraged to incorporate measures into their cropland idling transfer to protect habitat value in the area to be idled. Idled land cannot be irrigated during the transfer season, but vegetation that is supported only through precipitation or that has begun to senesce may remain on the idled fields. Excessive vegetation supported by seepage from irrigation supplies or shallow groundwater would result in a decrease in the amount of water available for cropland idling transfer.

Crop Shifting

For crop shifting transfers, water is made available when farmers shift from growing a higher water use crop to a lower water use crop. The difference in the accepted ETAW values between the two crops would be the amount of water that can be transferred. Transfer water generated by crop shifting is difficult to account for. Farmers generally rotate between several crops to maintain soil quality, so water agencies may not know what type of crop would have been planted in a given year absent a transfer. To calculate water available from crop shifting, agencies would estimate what would have happened absent a transfer using an average water use over a consecutive five-year baseline period. The change in consumptive use between this baseline water use and the lower water use crop determines the amount of water available for transfer.

Conservation

Conservation transfers must include actions to reduce the diversion of surface water by the transferring entity by reducing irrecoverable water losses. The amount of reduction in irrecoverable losses determines the amount of transferrable water. Conservation measures may be implemented on the water-district and individual user scale. These measures must reduce the irrecoverable losses at a site without reducing the amount of water that otherwise would have been available for downstream beneficial uses. Irrecoverable losses include water that would not be usable because it currently flows to a salt sink, to an inaccessible or degraded aquifer, or escapes to the atmosphere.

2.3.2.2 Potential Transfer Participants

The sections below identify potential transfer sellers and buyers that are analyzed in this EIS/EIR. Figure 2-4 shows the locations of sellers.

Sellers

Table 2-4 lists the agencies that have expressed interest in being a seller in the Long-Term Water Transfers EIS/EIR and the potential maximum quantities available for sale. Table 2-5 shows the potential upper limit of available water for transfer by each agency for each transfer type; however, actual purchases could be less, depending on hydrology, the amount of water the seller is interesting in selling in any particular year, the interest of buyers, and compliance with Central Valley Project Improvement Act transfer requirements, among other possible factors. Additionally, these transfers would not occur every year, but only years when there is demand from buyers and pumping capacity available to convey the transfers (generally dry and critical years). Modeling analysis indicates that using hydrology from 1970-2003, transfers could occur in 12 of the 33 years.

Because of the uncertainty of hydrologic and operating conditions in the future, it is likely that only a portion of the potential transfers identified in Table 2-4 would occur. Additionally, many agencies are uncertain about whether they would participate through groundwater substitution or cropland idling/crop shifting transfers. They have included their potential upper limit for both types of transfers, but they would not sell the maximum amount of both types in the same year. The maximum amount for each agency would not exceed the amount shown in Table 2-4. Table 2-5 shows the potential quantities of water that could be made available from April through June and July through September; the quantities available in April, May, and June would be able to be transferred if storage is available (see Section 2.3.2.3.1). Entities requiring Reclamation approval that are not listed in this table may decide that they are interested in selling water, but those transfers may require supplemental NEPA and Endangered Species Act analysis to allow Reclamation to complete the evaluation of the transfers.

Sellers that are not specifically listed in this document may be able to sell water to the buyers as long as: the water that is made available occurs in the same water shed or ground water basin analyzed in this EIS/EIR, the total quantity of water proposed for sale does not exceed the maximums listed for each region or type of transfer in any given transfer year, the transfer does not exceed the magnitude of the impacts assessed, and any potential mitigation required can be effectively implemented. On a case-by-case basis, Reclamation would evaluate proposals from sellers not included in this document to determine whether or not the impacts have been adequately assessed in this EIS/EIR.

Table 2-4. Alternative 2 Potential Sellers (Upper Limits)

Water Agency	Maximum Potential Transfer (acre-feet per year)
Sacramento River Area of Analysis	
Anderson-Cottonwood Irrigation District	5,225
Conaway Preservation Group	35,000
Cranmore Farms	8,000
Eastside Mutual Water Company	2,230
Glenn-Colusa Irrigation District	91,000
Natomas Central Mutual Water Company	30,000
Pelger Mutual Water Company	3,750
Pleasant Grove-Verona Mutual Water Company	18,000
Reclamation District 108	35,000
Reclamation District 1004	17,175
River Garden Farms	9,000
Sycamore Mutual Water Company	20,000
Te Velde Revocable Family Trust	7,094
American River Area of Analysis	
City of Sacramento	5,000

Water Agency	Maximum Potential Transfer (acre-feet per year)
Placer County Water Agency	47,000
Sacramento County Water Agency	15,000
Sacramento Suburban Water District	30,000
Yuba River Area of Analysis	
Browns Valley Irrigation District	8,100
Cordua Irrigation District	12,000
Feather River Area of Analysis	
Butte Water District	17,000
Garden Highway Mutual Water Company	14,000
Gilsizer Slough Ranch	3,900
Goose Club Farms and Teichert Aggregates	10,000
South Sutter Water District	15,000
Tule Basin Farms	7,320
Merced River Area of Analysis	
Merced Irrigation District	30,000
Delta Region Area of Analysis	
Reclamation District 2068	7,500
Pope Ranch	2,800
Total	**511,094**

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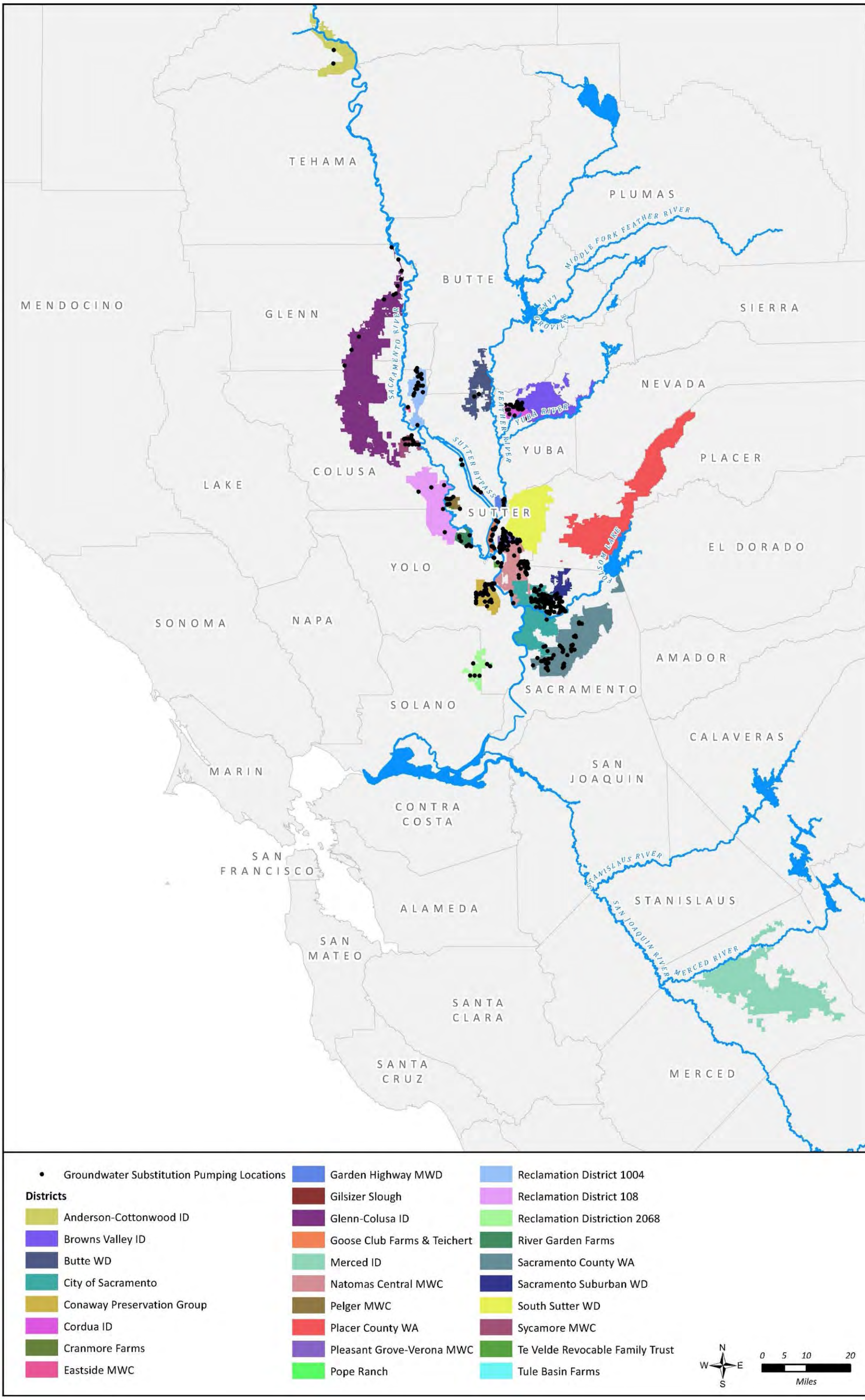

Figure 2-4. Locations of Potential Sellers

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Table 2-5. Alternative 2 Transfers Types (Upper Limits)

Water Agency	April-June Groundwater Substitution (acre-feet)	April-June Cropland Idling/ Crop Shifting (acre-feet)	April-June Stored Reservoir Release (acre-feet)	April-June Conservation (acre-feet)	July-Sep Groundwater Substitution (acre-feet)	July-Sep Cropland Idling/Crop Shifting (acre-feet)	July-Sep Stored Reservoir Release (acre-feet)	July-Sep Conservation (acre-feet)
Sacramento River Area of Analysis								
Anderson-Cottonwood Irrigation District	2,613				2,613			
Conaway Preservation Group	21,550	7,899			13,450	13,450		
Cranmore Farms	5,140	925			2,860	1,575		
Eastside Mutual Water Company	1,067				1,163			
Glenn-Colusa Irrigation District	12,500	24,420			12,500	41,580		
Natomas Central Mutual Water Company	15,000				15,000			
Pelger Mutual Water Company	2,151	939			1,599	1,599		
Pleasant Grove-Verona Mutual Water Company	8,000	3,330			10,000	5,670		
Reclamation District 108	7,500	7,400			7,500	12,600		
Reclamation District 1004		3,700			7,175	6,300		
River Garden Farms	4,000				5,000			
Sycamore Mutual Water Company	7,500	3,700			7,500	6,300		
Te Velde Revocable Family Trust	2,700	2,581			4,394	4,394		
American River Area of Analysis								
City of Sacramento					5,000			
Placer County Water Agency							47,000	
Sacramento County Water Agency					15,000			
Sacramento Suburban Water District	15,000				15,000			

Water Agency	April-June Groundwater Substitution (acre-feet)	April-June Cropland Idling/ Crop Shifting (acre-feet)	April-June Stored Reservoir Release (acre-feet)	April-June Conservation (acre-feet)	July-Sep Groundwater Substitution (acre-feet)	July-Sep Cropland Idling/Crop Shifting (acre-feet)	July-Sep Stored Reservoir Release (acre-feet)	July-Sep Conservation (acre-feet)
Yuba River Area of Analysis								
Browns Valley Irrigation District							5,000	3,100
Cordua Irrigation District					12,000			
Feather River Area of Analysis								
Butte Water District	2,750	5,750			2,750	5,750		
Garden Highway Mutual Water Company	6,500				7,500			
Gilsizer Slough Ranch	1,500				2,400			
Goose Club Farms and Teichert Aggregates	4,000	3,700			6,000	6,300		
South Sutter Water District							15,000	
Tule Basin Farms	3,800				3,520			
Merced River Area of Analysis								
Merced Irrigation District							30,000	
Delta Region Area of Analysis								
Reclamation District 2068	2,250	2,775			2,250	4,725		
Pope Ranch	1,400				1,400			
Total[1]	126,921	67,119	0	0	163,574	110,243	97,000	3,100

Note:

[1] These totals cannot be added together. Agencies could make water available through groundwater substitution, cropland idling, or a combination of the two; however, they will not make the full quantity available through both methods. Table 2-4 reflects the total upper limit for each agency.

Buyers

Table 2-6 identifies potential buyers who may be interested in participating in water transfers (similar to Table 1-2). Not all of these potential buyers may end up actually purchasing water. For some potential buyers, purchase decisions would depend on the ability to move the purchased water through the Delta to the buyer's service area.

Table 2-6. Alternative 2 Potential Buyers

San Luis & Delta-Mendota Water Authority Participating Members
Byron-Bethany Irrigation District
Del Puerto Water District
Eagle Field Water District
Mercy Springs Water District
Pacheco Water District
Panoche Water District
San Benito County Water District
San Luis Water District
Santa Clara Valley Water District
Westlands Water District
Contra Costa Water District
East Bay Municipal Utility District

2.3.2.3 Water Transfer Operations

Water transfer operations are discussed by geographic region. Transfer operations could affect river flows and timing of flows upstream or downstream from the point of diversion. The following sections describe how potential transfers would operate on rivers.

Sellers Service Area

As shown in Figure 2-2, both the Sacramento and San Joaquin Rivers flow into the Delta. The Sacramento River enters the Delta from the northeast and flows are regulated through releases from CVP-owned Shasta Reservoir and Folsom Reservoir, as well as the SWP-owned Lake Oroville. Major tributaries to the Sacramento River include the Yuba, Feather, and American Rivers. The South, North and Middle forks of the American River converge at the Folsom Reservoir. The San Joaquin River enters the Delta from the southeast; major tributaries include the Merced and Stanislaus Rivers.

Transfers that must be conveyed through the Delta are limited to periods when capacity at C.W. "Bill" Jones Pumping Plant (Jones Pumping Plant) and Harvey O. Banks Pumping Plant (Banks Pumping Plant) is available typically from July through September, and only after Project needs are met. Reclamation and DWR must also declare that the Delta is in "balanced conditions" under the terms of the COA (USFWS 2008). CVP transfer water conveyed at Banks Pumping Plant could occur upon the SWRCB's approval of Joint Points of

Diversion. The Delta pumping restrictions do not apply to East Bay Municipal Utility District (MUD) diversions at Freeport.

The timing of transfers from potential agricultural sellers upstream from the Delta by groundwater substitution, cropland idling, and crop shifting would be dictated by the irrigation season. While land owners may be able to postpone groundwater substitution until the adequate capacity is available at the Delta pumps, water from crop idling/shifting would be made available on the same pattern as it would have otherwise been used for irrigation. At the start of the irrigation season, the Delta pumps cannot pump water for transfer because the current biological opinions on CVP and SWP operations typically only allow for transfers from July through September. Transfer water made available prior to July would either bypass the pumps, or may be stored in upstream reservoirs if Project operations can account for the storage. However, as described in subsequent sections, Shasta Reservoir is operated to meet mandated temperature and flow requirements in the Sacramento River, which limits its ability to store water to support transfers.

Sacramento River

Potential sellers on the Sacramento River include Conaway Preservation Group, LLC, Cranmore Farms, LLC, Glenn-Colusa Irrigation District (ID), Pelger Mutual Water Company (MWC), Pleasant Grove-Verona MWC, Reclamation District 108, Reclamation District 1004, Sycamore MWC, and Te Velde Revocable Family Trust, which may provide water made available through groundwater substitution or crop idling/shifting actions. Anderson-Cottonwood ID, Eastside MWC, Natomas MWC, and River Garden Farms plan to transfer water made available through groundwater substitution only.

Potential sellers receive CVP water that is stored upstream from their service areas in Shasta Reservoir, a CVP facility. Releases from Shasta Reservoir may be routed through or around the Shasta Power Plant to the Sacramento River, where flows are re-regulated by Keswick Dam.

Delta conveyance capacity would be available when conditions for sensitive species are acceptable to NOAA Fisheries and USFWS, typically from July through September, but groundwater substitution and cropland idling/crop shifting transfers would be available from April through September. Storing water in Shasta Reservoir from April through June would help facilitate these types of transfers; however, Shasta Reservoir has a very limited capacity to store transfer water from April through June because of downstream temperature requirements. Reclamation is required by SWRCB Water Rights Orders 90-05/91-01 to meet average daily temperature requirements as far downstream as practical when temperatures could affect fish. To meet requirements, Reclamation must carefully manage the cold water pool in Shasta Reservoir by releasing larger quantities of water earlier in the season; larger flows maintain cooler temperatures for a longer distance downstream. Reducing releases to hold transfer water in storage could affect Reclamation’s ability to meet these downstream temperature requirements. Reclamation would only consider storing water for transfers if it would not affect releases for temperature, or if it could be "backed up" into another reservoir (by reducing releases from that reservoir). Backing up water may be possible if the Delta is in balanced conditions and instream standards are met. The decision to back up transfer water would be made on a case-by-case basis, but storage is analyzed in this EIS/EIR so that the analysis is complete in the event Reclamation determines that storage is possible in a specific year.

Because of the limitations associated with storing transfer water, crop idling transfers would be more difficult to implement. Cropland idling cannot be started partway through the irrigation season, so the water made available from April through June would bypass the pumps and become Delta outflow if it cannot be stored. Sacramento River sellers and buyers would generally prefer water transfer options that are more flexible, such as starting groundwater substitution pumping when Delta pumping capacity for transfers is available.

Proposed sellers divert water from various locations along the Sacramento River or the Sutter Bypass. If a seller shifts from using surface water to groundwater when a transfer is implemented, river flows would not decrease from Shasta Reservoir to the point of diversion absent transfers. River flow would then increase from the seller's usual diversion point downstream to the buyer's point of diversion because water is not diverted for use until it reaches the Delta.

If Reclamation determines that it can store water in Shasta Reservoir, the flows in the Sacramento River between Shasta Reservoir and the point of diversion absent transfers would decrease from April through June. Flows downstream of the point of diversion would not change during this period.

American River

The City of Sacramento, Sacramento County Water Agency and Sacramento Suburban Water District (WD) could sell water on the American River system through groundwater substitution. Placer County Water Agency could generate additional transfer water through the release of stored water from Hell Hole and French Meadows Reservoirs (see Figure 2-5). Folsom Reservoir is the primary storage and flood control reservoir on the American River. Releases from Folsom Reservoir are re-regulated at Nimbus Dam, which is about seven miles downstream from Folsom Dam.

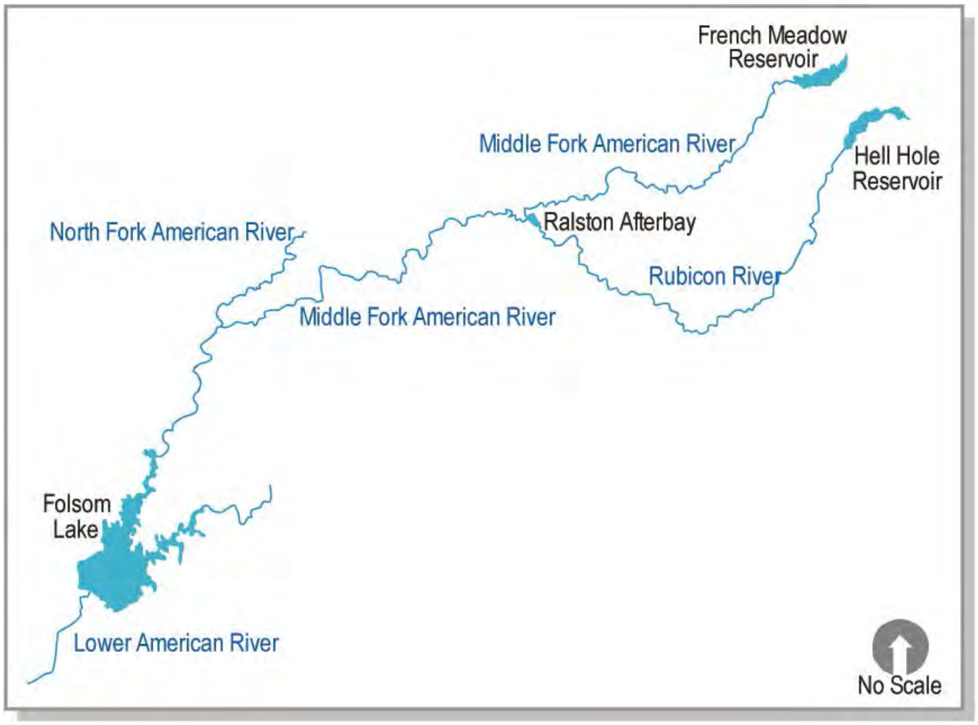

Figure 2-5. American River Facilities

Storage in Folsom Reservoir is not as restricted as Shasta Reservoir, but Reclamation generally cannot guarantee storage in Folsom Reservoir prior to the transfer season because operational complexities may require water releases.

The Sacramento Suburban WD would use groundwater to offset surface water supplies from the American River. The Sacramento Suburban WD receives surface water from the City of Sacramento or Placer County Water Agency out of Folsom Reservoir. When transferring water through groundwater substitution, the Sacramento Suburban WD would take less surface water, leaving the water in storage in Folsom Reservoir. This water may be able to be stored in Folsom Reservoir before being conveyed south-of-Delta, depending on year-to-year operational restrictions on the export pumps. Storing water in Folsom Reservoir would likely be possible because this water would not otherwise have been released to the river absent the transfer.

Placer County Water Agency would release stored surface water from Hell Hole and French Meadows Reservoirs. It would time release of water to coincide with the availability of Delta export capacity, generally starting in July. Placer County Water Agency's release schedule would be influenced by power generation, so it may wish to release water before July continuing through September to generate power and reregulate that water in Folsom Reservoir until the water can be conveyed through the Delta export pumps. Non-Project water in Folsom Reservoir for greater than 30 days requires a Warren Act

Contract[2] for storage. Placer County Water Agency would release water that would otherwise have remained in storage; therefore, this water would increase flows downstream along the Middle Fork of the American River to Folsom Reservoir, and downstream of Folsom Reservoir from July through September. The water releases would leave additional storage capacity in the reservoirs that would be refilled during the following wet seasons (at times that it would not affect downstream users, see Section 2.1.1.3 for more information). Refilling the empty storage would decrease flows downstream of the reservoirs; therefore, a refill agreement would be required as part of any transfer.

Yuba River

Browns Valley ID and Cordua ID are the potential sellers on the Yuba River. Browns Valley ID generates water for transfer through conservation efforts or stored reservoir release. Browns Valley ID water for transfer from conservation may be generated through the Upper Main Water Conservation Project. This project was initiated in 1990 to terminate use of the Upper Main Canal, a Gold Rush Era water conveyance facility that served facilities downstream of Collins Lake. The Canal experienced substantial losses during conveyance to vegetation along the Canal system. The conservation project replaced the Canal with a pipeline and reduced associated losses to vegetation, thereby creating water for transfers.

Browns Valley ID could also make water available by releasing water from Merle Collins Reservoir that otherwise would have remained in storage. Release of this water would increase flows downstream in Dry Creek and in the Yuba River downstream of the confluence with Dry Creek. Similar to stored reservoir release transfers from Placer County Water Agency, refilling the reservoir would decrease flows downstream of the reservoir; therefore, a refill agreement would be required for the transfer.

Cordua ID would transfer water made available through groundwater substitution actions. This transfer would increase flows on the Yuba River downstream of Cordua ID's point of diversion (absent the transfer) during the transfer period.

Feather River

Potential sellers on the Feather River include Butte WD (groundwater substitution and crop idling/shifting), Garden Highway MWC (groundwater substitution), Gilsizer Slough Ranch (groundwater substitution), Goose Club Farms and Teichert Aggregates (groundwater substitution and crop idling/shifting), South Sutter WD (stored reservoir release), and Tule Basin Farms (groundwater substitution).

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[2] The Warren Act of February 21, 1911 authorized the United States to execute contracts for the conveyance and storage of non-project water in Federal facilities when excess capacity exists.

Butte WD is a member agency of the Joint Water Districts Board (Joint Board). The Joint Board has a settlement agreement with DWR and the water supply under that agreement is distributed among the four member agencies of the Joint Board. DWR approval would be required for a transfer from Butte WD. DWR makes releases from Lake Oroville to Thermalito Afterbay for diversion by Butte WD. Changes in diversion from Thermalito Afterbay would result in changes in DWR's releases to the Afterbay but would not change Feather River flows. An increase in flows in the Feather River would result when the transfer water was released by DWR to the Feather River. The timing of releases could change from the timing of diversions by Butte WD from Thermalito Afterbay absent the transfer.

Garden Highway MWC has a settlement agreement with DWR to divert water from the Feather River for irrigation use. A transfer from Garden Highway MWC must be approved by DWR. A reduction in diversions from Garden Highway MWC would result in higher flows in the Feather River downstream of the existing point of diversion.

Goose Club Farms and Teichert Aggregates divert water from the Feather River and Sacramento Slough for irrigation. For a transfer from either of these entities, surface water would not be diverted, which would result in higher flows in the Feather River downstream of the points of diversion during the transfer period.

Gilsizer Slough Ranch diverts water from the East Canal of the Sutter Bypass, Gilsizer Slough, and a drainage canal. Tule Basin Farms diverts water from the West Canal of the Sutter Bypass. Transfers from these entities would increase flows downstream of their points of diversion absent the transfer, which would increase flows in the Sutter Bypass canals and downstream in the Sacramento River.

DWR operates Lake Oroville on the Feather River, which is upstream from the diversion locations for these entities. At times, DWR has the ability to retain water in Lake Oroville that would have been released for diversion by Butte WD and Garden Highway MWC during April through June until the Delta export pumps have capacity to convey the water. Any transfer agreement with DWR for Butte WD or Garden Highway MWC would need to include approval to store water in Lake Oroville before DWR could provide storage for the transfer. DWR cannot approve storage in Lake Oroville if it would affect SWP operations. The transfer water would be the first water to be spilled if Lake Oroville reaches flood capacity. River flows would increase downstream of the sellers' points of diversion (absent the transfer) when the stored transfer water is released.

South Sutter WD could provide water through stored reservoir release. Stored reservoir releases would be from Camp Far West Reservoir (see Figure 2-6). During the transfer period, Camp Far West Reservoir would be slightly lower than conditions without the transfer until the reservoir is refilled. River flows downstream of the reservoir on the Bear River, Feather River, and Sacramento River would increase during the release period. Camp Far West Reservoir would refill as water was available in the Bear River and when the Delta is in excess conditions, which would decrease flows downstream from the reservoir relative to non-transfer conditions. A refill agreement would be required for this transfer to avoid affects to downstream water users.

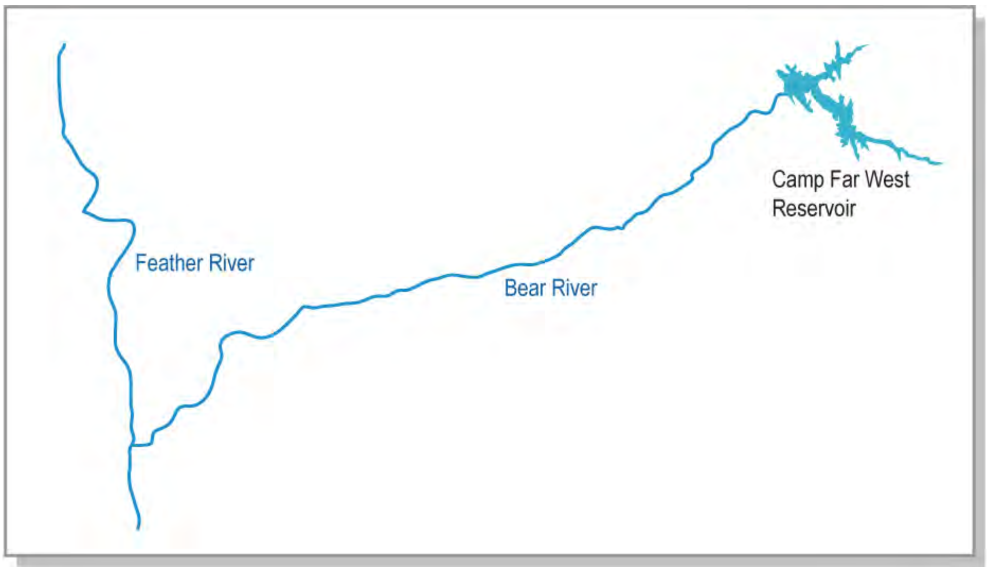

Figure 2-6. Bear River Facilities

Merced River

Merced ID could provide water through stored reservoir release. Stored reservoir releases would be from Lake McClure (see Figure 2-7). During the transfer period, water elevations in Lake McClure would be slightly lower than conditions without the transfer until the reservoir is refilled. Lake McClure would refill as water was available in the Merced River and when the Delta is in excess conditions, which would decrease flows downstream from the reservoir relative to non-transfer conditions.

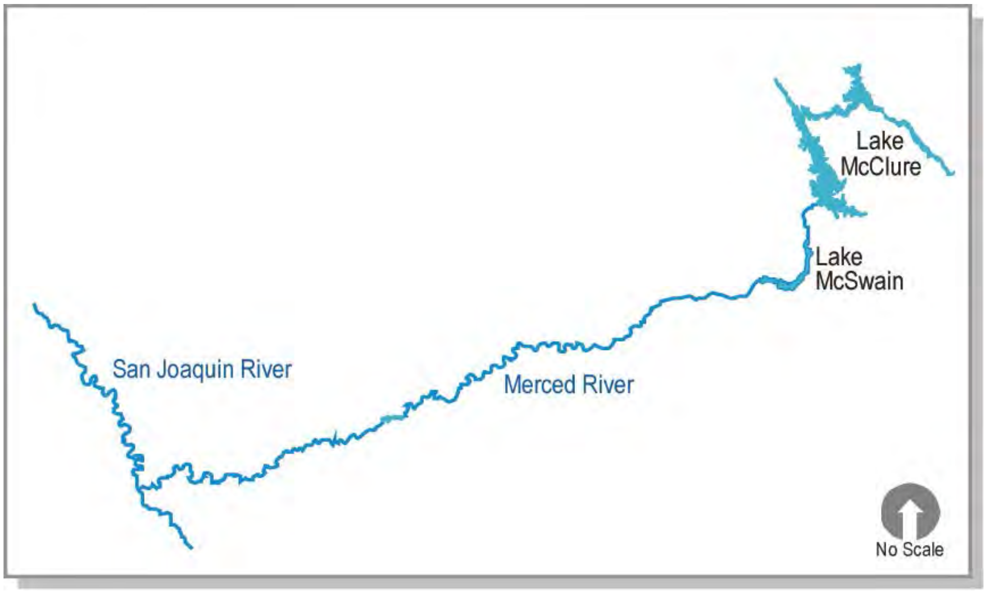

Figure 2-7. Merced River Facilities

Merced ID's transferred water could be conveyed to the Buyers Service Area in several ways:

- Water could flow down the Merced River, through the San Joaquin River, and be diverted through the Jones or Banks Pumping Plants in the Delta.
- Water could flow down the Merced River into the San Joaquin River and be diverted through existing facilities within Banta Carbona ID, West Stanislaus ID, or Patterson ID (see Figure 2-8). These agencies would either convey the water through their districts to the Delta-Mendota Canal, or they would use the water diverted from the San Joaquin River in exchange for their CVP water from the Delta-Mendota Canal.
- Water would enter the Merced River and be diverted into the Eastside Canal before reaching the San Joaquin River confluence. Water could be delivered for exchange to San Luis Canal Company, which would reduce its use of water from the Delta-Mendota Canal.
- Water would be diverted from Lake McClure for delivery through Merced ID's internal conveyance facilities to one of the refuges in the San Luis unit for exchange. The refuge would reduce its use of water from the Delta-Mendota Canal. This delivery mechanism would not change flows in any surface water body and could therefore be used year-round.

The timing of these transfers would depend on the limitations at the diversion point. Transfers through Jones and Banks Pumping Plants would be during periods acceptable to NOAA Fisheries and USFWS, typically from July through September, but the remaining delivery methods could be used throughout the irrigation season (April through September). A stored reservoir release transfer from Merced ID would require a refill agreement to clarify how the reservoir would be refilled after the transfer. Additionally, buyers would require a Warren Act Contract with Reclamation to provide for conveyance of non-CVP water through CVP facilities.

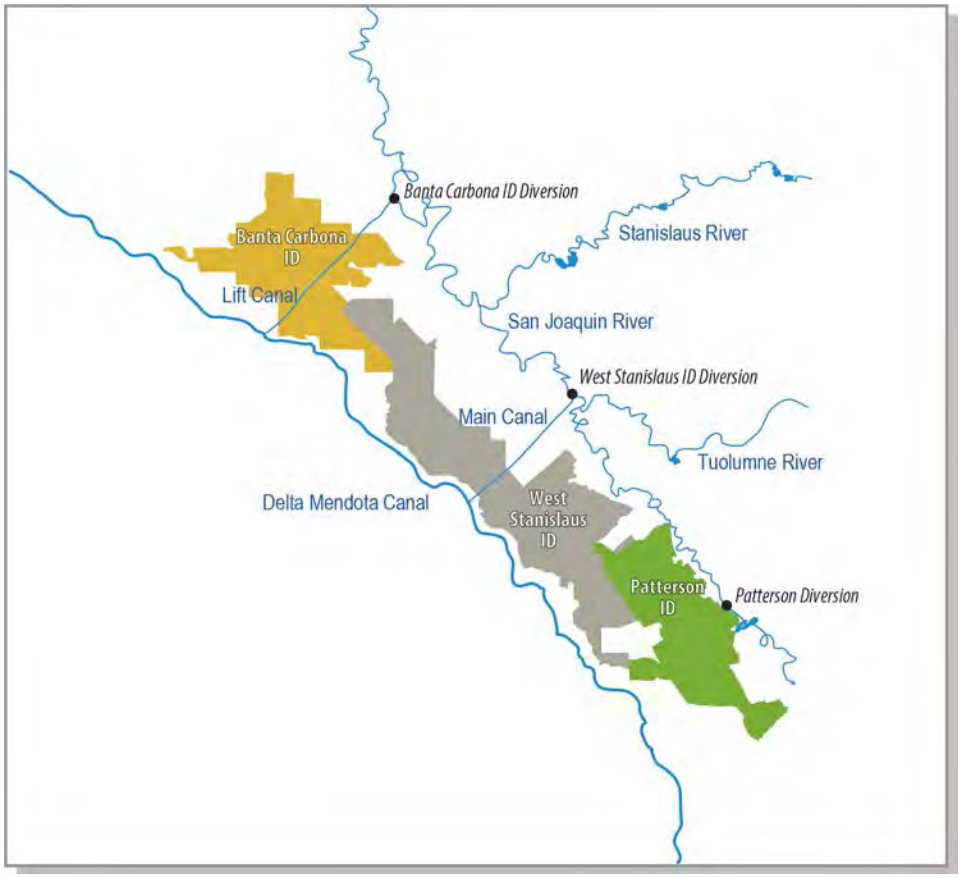

Figure 2-8. Diversion Facilities for Banta Carbona ID, West Stanislaus ID, and Patterson ID

Delta Region

The Sacramento and San Joaquin rivers join at the Sacramento-San Joaquin Delta. Pope Ranch could transfer water through groundwater substitution, and Reclamation District 2068 could transfer water through groundwater substitution and crop idling/shifting.

Transfers from potential sellers in the Delta have several challenges, including:

- Variability in ETAW values make calculating water savings from crop idling/shifting difficult;
- High groundwater table results in high evapotranspiration rates and excessive weed growth in idle fields;
- Hydraulic connectivity must be maintained at all times during the transfer period;
- The locations used in determining compliance with the Delta outflow-based objectives in D-1641 are upstream from the majority of the Delta diversions;
- Water made available outside the transfer window cannot be exported or stored in Delta; and,
- The status of many underlying water rights can be difficult to verify.

These challenges make it difficult to determine consumptive use and export transfer water. More extensive monitoring may be required throughout the transfer season compared to transfers from other locations to account for potential weed growth and evaporation from bare fields, which affects the amount of transfer water made available. Additionally, transfer proponents must obtain concurrence from the SWRCB that the estimated reduction in consumptive use can be accounted for separately in meeting flow related compliance objectives.

Buyers Service Area

Multiple buyers could purchase water made available for transfer; this EIS/EIR addresses transfers to the San Luis & Delta-Mendota Water Authority (SLDMWA), Contra Costa WD, and East Bay MUD. These entities receive water diverted in the Delta or its tributaries. The points of diversion in the Delta are shown on Figure 2-9. Diversions could also be made along the San Joaquin River (as shown in Figure 2-8), from the Merced River, or from Lake McClure.

SLDMWA

As discussed in Section 1, SLDMWA consists of ~~29~~ 28 member agencies representing water service contractors and San Joaquin River Exchange Contractors. The SLDMWA operates some CVP facilities and represents its member agencies' interests related to water supply issues. The SLDMWA does not directly supply water, but it would participate in negotiations to assist its participating members to secure transfers when needed and would assist with scheduling and managing the transferred water. Transfers to agencies within the SLDMWA would be pumped through the Jones or Banks pumping plants, or would be delivered through local facilities as described above. This water would then be conveyed through SWP or CVP canals and aqueducts and local irrigation canals to the purchasing agencies.

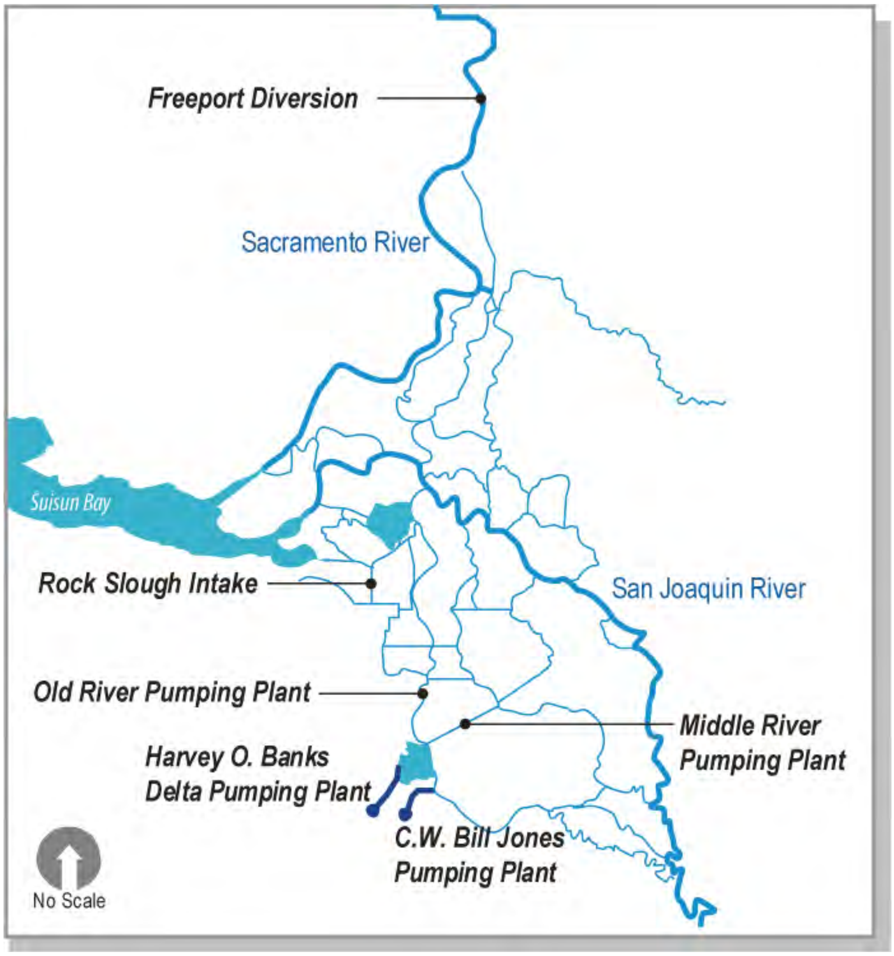

Figure 2-9. Delta Transfer Diversion Locations

Contra Costa WD

Contra Costa WD is an in-Delta water user and diverts both CVP water and water under its own water rights from Delta drinking water intakes located at Rock Slough, Old River near Highway 4, Middle River at Victoria Canal, and Mallard Slough. Contra Costa WD is interested in purchasing transfer water to augment dry year supplies.

East Bay MUD

Water transfers to the East Bay MUD would be diverted at the Freeport Regional Water Authority's intake on the Sacramento River near Freeport, at the northern end of the Delta. These transfers would not pass through the Delta and therefore would not be subject to constraints on through Delta pumping. Once diverted from the Sacramento River, water transferred to East Bay MUD would travel eastward through 16 miles of underground pipeline to the Folsom

South Canal. After flowing 14 miles to the southern end of the canal, the water would be pumped via 18 miles of pipeline to East Bay MUD's Mokelumne Aqueducts, which cross the Delta and deliver the water to East Bay MUD's service district in the East Bay.

2.3.2.4 Environmental Commitments

Several environmental commitments are included in the Proposed Action to avoid potential environmental impacts from water transfers.

Groundwater Substitution Transfers

- In groundwater basins where sellers are in the same groundwater subbasin as protected aquatic habitats, such as giant garter snake preserves and conservation banks, groundwater substitution will be allowed as part of the long term water transfers if the seller can demonstrate that any impacts to water resources needed for special-status species protection have been addressed. In these areas, sellers will be required to address these impacts as part of their mitigation plan.

All Transfer Methods

- Carriage water (a portion of the transfer that is not diverted in the Delta and becomes Delta outflow) will be used to maintain water quality in the Delta. Carriage water calculations will also reflect conveyance losses as the water moves from its source to the Delta export pumps, and is conveyed from the Delta to buyers. Carriage water is represented as a percent of the transfer that does not reach the buyer, and this percent is calculated during the transfer based on real-time monitoring information in the Delta. Typical carriage water amounts range from 20 to 30 percent for transfers from the Sacramento Valley, and about 10 percent for transfers from the San Joaquin Valley.

Cropland Idling Transfers

- As part of the approval process for long-term water transfers, Reclamation will have access to the land to verify how the water transfer is being made available and to verify that actions to protect the giant garter snake are being implemented. At the end of each water transfer year, Reclamation will prepare a monitoring report that contains the following:

  - Maps of all cropland idling actions that occurred within the range of potential transfer activities analyzed in this EIS/EIR,

  - Results of any newly available scientific research and monitoring results pertinent to water transfer actions, and

  - A discussion of conservation measure effectiveness.

The report will be submitted to USFWS and shared with California Department of Fish and Wildlife (CDFW) in February, prior to the next year of potential transfers. Reclamation will coordinate with USFWS and CDFW on the contents and findings of the annual report prior to additional transfers.

- Reclamation will establish annual meetings with the USFWS to discuss the contents and findings of the annual report. These meetings will be scheduled following the distribution of the monitoring report and prior to the next transfer season.

- Reclamation will provide a map(s) to the USFWS in June of each year showing the parcels of riceland that are ~~idled~~ proposed for the purpose of transferring water for that year. These maps will be prepared to comport to Reclamation's geographic information system (GIS) standards.

- Movement corridors for aquatic species (including pond turtle and giant garter snake) include major irrigation and drainage canals. The water seller will keep adequate water in major irrigation and drainage canals. Canal water depths should be similar to years when transfers do not occur or, where information on existing water depths is limited, at least two feet of water will be considered sufficient.

- Districts proposing water transfers made available from idled rice fields will ensure that adequate water is available for priority habitat with a high likelihood of giant garter snake occurrence. The determination of priority habitat will be made through coordination with giant garter snake experts, GIS analysis of proximity to historic tule marsh, and GIS analysis of suitable habitat. The priority habitat areas are indicated on the priority habitat maps for participating water agencies and will be maintained by Reclamation. As new information becomes available, these maps will be updated in coordination with USFWS and CDFW. In addition to mapped priority habitat, fields abutting or immediately adjacent to federal wildlife refuges will be considered priority habitat.

- Maintaining water in smaller drains and conveyance infrastructure supports key habitat attributes such as emergent vegetation for giant garter snake for escape cover and foraging habitat. If crop idling/shifting occurs in priority habitat areas, Reclamation will work with contractors to document that adequate water remains in drains and canals in those priority areas. Documentation may include flow records, photo documentation, or other means of documentation agreed to by Reclamation and USFWS.

- Mapped priority habitat known to be occupied by giant garter snake and priority habitats with a high likelihood for giant garter snake occurrence (60 percent or greater probability) ~~Areas with known priority giant garter snake populations~~ will not be permitted to participate in cropland idling/shifting transfers. Water sellers can request a case-by-case evaluation of whether a specific field would be precluded from participating in long-term water transfers. These areas include lands adjacent to naturalized lands and refuges and corridors between these areas, such as:

  - Fields abutting or immediately adjacent to Little Butte Creek between Llano Seco and Upper Butte Basin Wildlife Area, Butte Creek between Upper Butte Basin and Gray Lodge Wildlife areas, Colusa Basin drainage canal between Delevan and Colusa National Wildlife Refuges, Gilsizer Slough, Colusa Drainage Canal, the land side of the Toe Drain along the Sutter Bypass, Willow Slough and Willow Slough Bypass in Yolo County, Hunters and Logan Creeks between Sacramento and Delevan National Wildlife Refuges; and

  - Lands in the Natomas Basin.

- Sellers will ~~continue to voluntarily~~ perform giant garter snake best management practices, including educating maintenance personnel to recognize and avoid contact with giant garter snake, dredging~~cleaning~~ only one side of a conveyance channel per year, and implementing other measures to enhance habitat for giant garter snake. Implementation of best management practices will be documented by the sellers and verified by Reclamation and will be included in the annual monitoring report.

- In order to limit reduction in the amount of over-winter forage for migratory birds, including greater sandhill crane, cropland idling transfers will be minimized near known wintering areas that support high concentrations of waterfowl and shorebirds, such as wildlife refuges and established wildlife areas. ~~in the Butte Sink.~~

2.3.2.5 Transfer Quantities

Table 2-4 provides a list of entities that could potentially sell water for transfers in the future. The table also includes maximum quantities that each agency could make available through different transfer mechanisms. Adding these maximum quantities produces a total of a little over 500,000 AF, but multiple other factors may limit the transfers to a number that is likely less than this total. Transfers to East Bay MUD and Contra Costa WD are limited by available pumping capacity at the Freeport intake and Contra Costa WD's Delta intakes, respectively, as well as other system constraints such as service area demand and available storage. Transfers to south-of-Delta water districts, which account for the majority of proposed transfers, are typically pumped through the

CVP and SWP south Delta export facilities. The capacity to pump the water at Banks and Jones Pumping Plants would limit the overall volume of transfers to south-of-Delta water districts. Factors that affect capacity available for transfers to south-of-Delta water districts include:

- Water availability: many potential sellers are listed for both cropland idling and groundwater substitution; however, they would not transfer the full amount under both mechanisms or the same amount in all years. The decision to transfer water is often a complex business decision made by individual landowners in a district. Each landowner weighs the economic value of irrigating land with surface water, selling the surface water and idling a field, or selling the surface water and irrigating with pumped groundwater. The economic value of any of these decisions is highly variable and depends on unpredictable trends in agricultural and water markets.

- Biological opinions: the biological opinions on the long-term operations of the CVP and SWP ~~restrict~~ may reduce exports from December through June and potentially in some fall seasons for the protection of special-status species. Historically, the CVP and SWP pumped significant amounts of water during these months for Project purposes because flows are usually high. Project water pumped during this period is typically stored in San Luis Reservoir or DWR's southern California reservoirs for use during the following summer. With current Delta pumping restrictions, the CVP and SWP pump more water during the late summer period for Project purposes than they did historically, which is the same period when the biological opinions allow transfer water to be pumped (typically July through September). The increased CVP and SWP pumping leaves less remaining pumping capacity for transfer water.

- September: During certain years, much of the capacity to pump transfer water from the Delta is available in September. In some years, the Delta pumps have no capacity available until September. September capacity would be more challenging to use because increasing streamflows in the Sacramento, Feather, American, and San Joaquin rivers downstream of Project reservoirs during September could create a requirement for higher flows in October so that fish do not experience a dramatic flow change. Higher flows in October would correspond to higher reservoir releases at a time when the Delta pumping would be restricted. Reclamation and DWR may not be able to capture the additional releases at the Delta pumps.

- SWRCB's Water Rights Decision 1641: The decision requires Response Plans for water quality and water levels to protect diverters in the south Delta that may affect the opportunity to export transfers.

- Outages: Any planned or unplanned outages could reduce available capacity for transfers.

- Competition: Most of the pumping capacity available would be at the Banks Pumping Plant except for very dry years. Banks is an SWP facility, so SWP-related transfers would have priority. Agreements with DWR would be required for any transfers using SWP facilities.

Figure 2-10 shows an exceedance plot of the available export pumping capacity in the Projects' south Delta pumping facilities during periods when buyers may want to transfer water (when SWP allocations are less than 60 percent). An exceedance plot shows how often capacities are exceeded. For example, the July and August capacity curve shows that the capacity is above zero only about 35 percent of the time. In other words, the pumps have no capacity for transfer water in 65 percent of years studied. The figure includes July and August capacity separately from the capacity of all three months (July through September) because September pumping capacity may be more difficult to use and including that capacity makes the available capacity look much larger. This figure is from the CalSim modeling of the future conditions without transfers. Figure 2-10 shows that available capacity will limit the amount of transfers in most years to less than the quantities shown in Table 2-4.

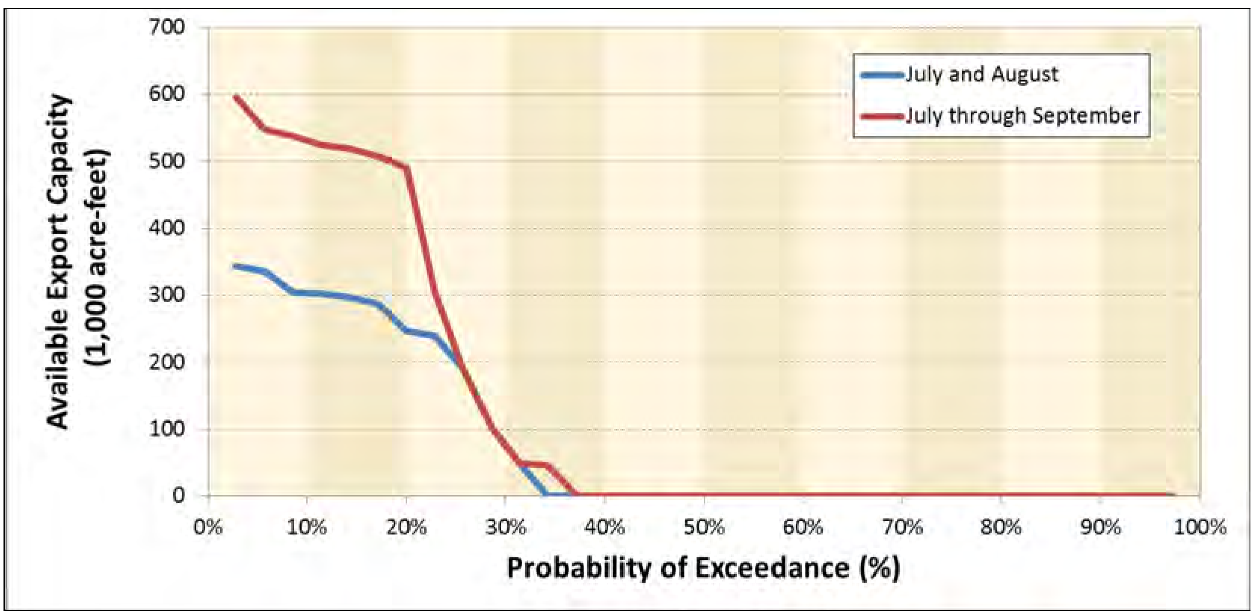

Figure 2-10. Available Delta Pumping Capacity for Transfers

2.3.2.6 Risk and Uncertainty

Transferring water from north of the Delta to south of the Delta would involve uncertainty and risk. The CVP and SWP would convey this water using the Jones and Banks Pumping Plants, but the CVP and SWP must first meet regulatory requirements and the needs of their users. CVP and SWP operations are governed by the criteria contained in SWRCB Decision 1641 (D-1641), the 2008 USFWS and 2009 NOAA Fisheries biological opinions, and all other regulatory restrictions governing operations.

Buyers and sellers often negotiate transfers during the wet season before hydrologic conditions are clear. Late season precipitation could increase the amount of available water for the CVP and SWP and reduce or eliminate available capacity for transfers. The CVP and SWP may not know the capacity in advance and would not guarantee available capacity; any uncertainty regarding capacity would rest with the buyers and sellers.

Transfers, particularly cropland idling, could be heavily affected by this uncertainty. Growers would need to idle crops at the beginning of the growing season, which typically occurs in April or May. The possibility exists that buyers and sellers would negotiate a crop idling transfer at the beginning of April, the seller would leave fields idle, and late-season rains could reduce excess capacity at the Delta pumps and prevent this water from being exported. This risk would typically fall on the buyers after the water purchase agreements are negotiated.

2.3.2.7 Transfer Length

Buyers and sellers may negotiate transfers that last one year or multiple years. Sellers and buyers would typically negotiate the terms of a single year transfer during the wet season and could finalize an agreement after the hydrologic conditions are understood well enough to establish available pumping capacity.

Sellers and buyers could also negotiate multi-year transfers. In this type of transfer, a long-term agreement would generally give the buyer the first right of refusal for water that a seller makes available. The buyer could pay the seller a fee every year to reserve the water, whether the buyer purchases it or not in any one year. In years where adequate capacity exists to convey water through the Delta, the buyer would have priority to buy the water at an established price. If the buyer does not want the water in a year when capacity is available, the seller could potentially negotiate a one-year transfer with another buyer.

2.3.2.8 CEQA Coverage Under Alternative 2

All transfers in this document are analyzed under NEPA, but not all transfers are included in the CEQA Proposed Project. Several transfers already have CEQA coverage, are obtaining CEQA coverage through a parallel effort or CEQA coverage will be prepared at the time a specific transfer is planned. These transfers include transfers from Browns Valley ID, transfers to East Bay MUD, and transfers to Contra Costa WD.

The Browns Valley ID, East Bay MUD, and Contra Costa WD transfers are not part of the Proposed Project (CEQA) but are part of the Proposed Action (NEPA). As a result, the effects of the Proposed Project are considered in context with these transfers, but these transfers are part of the Proposed Action and their effects are included in the analysis.

2.3.3 Alternative 3: No Cropland Modifications

Alternative 3 would include transfers through groundwater substitution, stored reservoir release, and conservation. It would not include any cropland idling or crop shifting transfers. Table 2-7 shows the potential sellers under Alternative 3. Buyers would be the same as those shown in Table 2-6, and transfers not included in the Proposed Project for CEQA would be the same as those described for Alternative 2. Environmental commitments would be the same as those described in Section 2.3.2.4 for the relevant transfer types.

2.3.4 Alternative 4: No Groundwater Substitution

Alternative 4 would include transfers through cropland idling, crop shifting, stored reservoir release, and conservation. It would not include any groundwater substitution transfers. Table 2-8 shows the potential sellers under Alternative 4. Buyers would be the same as those shown in Table 2-6, and transfers not included in the Proposed Project for CEQA would be the same as those described for Alternative 2. Environmental commitments would be the same as those described in Section 2.3.2.4 for the relevant transfer types.

Table 2-7. Alternative 3 Transfers Types (Upper Limits)

Water Agency	April – June			July - September		
	Groundwater Substitution (acre-feet)	Stored Reservoir Release (acre-feet)	Conservation (acre-feet)	Groundwater Substitution (acre-feet)	Stored Reservoir Release (acre-feet)	Conservation (acre-feet)
Sacramento River Area of Analysis						
Anderson-Cottonwood Irrigation District	2,613			2,613		
Conaway Preservation Group	21,550			13,450		
Cranmore Farms	5,140			2,860		
Eastside Mutual Water Company	1,067			1,163		
Glenn-Colusa Irrigation District	12,500			12,500		
Natomas Central Mutual Water Company	15,000			15,000		
Pelger Mutual Water Company	2,151			1,599		
Pleasant Grove-Verona Mutual Water Company	8,000			10,000		
Reclamation District 108	7,500			7,500		
Reclamation District 1004				7,175		
River Garden Farms	4,000			5,000		
Sycamore Mutual Water Company	7,500			7,500		
Te Velde Revocable Family Trust	2,700			4,394		
American River Area of Analysis						
City of Sacramento				5,000		
Placer County Water Agency					47,000	
Sacramento County Water Agency				15,000		
Sacramento Suburban Water District	15,000			15,000		
Yuba River Area of Analysis						
Browns Valley Irrigation District					5,000	3,100
Cordua Irrigation District				12,000		
Feather River Area of Analysis						
Butte Water District	2,750			2,750		
Garden Highway Mutual Water Company	6,500			7,500		
Gilsizer Slough Ranch	1,500			2,400		

Water Agency	April – June			July - September		
	Groundwater Substitution (acre-feet)	Stored Reservoir Release (acre-feet)	Conservation (acre-feet)	Groundwater Substitution (acre-feet)	Stored Reservoir Release (acre-feet)	Conservation (acre-feet)
Goose Club Farms and Teichert Aggregates	4,000			6,000		
South Sutter Water District					15,000	
Tule Basin Farms	3,800			3,520		
Merced River Area of Analysis						
Merced Irrigation District					30,000	
Delta Region Area of Analysis						
Reclamation District 2068	2,250			2,250		
Pope Ranch	1,400			1,400		
Total	126,921	0	0	163,574	97,000	3,100

Table 2-8. Alternative 4 Transfers Types (Upper Limits)

Water Agency	April – June			July - September		
	Cropland Idling/Crop Shifting (acre-feet)	Stored Reservoir Release (acre-feet)	Conservation (acre-feet)	Cropland Idling/Crop Shifting (acre-feet)	Stored Reservoir Release (acre-feet)	Conservation (acre-feet)
Sacramento River Area of Analysis						
Anderson-Cottonwood Irrigation District						
Conaway Preservation Group	7,899			13,450		
Cranmore Farms	925			1,575		
Eastside Mutual Water Company						
Glenn-Colusa Irrigation District	24,420			41,580		
Natomas Central Mutual Water Company						
Pelger Mutual Water Company	939			1,599		
Pleasant Grove-Verona Mutual Water Company	3,330			5,670		
Reclamation District 108	7,400			12,600		
Reclamation District 1004	3,700			6,300		
River Garden Farms						
Sycamore Mutual Water Company	3,700			6,300		
Te Velde Revocable Family Trust	2,581			4,394		
American River Area of Analysis						
City of Sacramento						
Placer County Water Agency					47,000	
Sacramento County Water Agency						
Sacramento Suburban Water District						
Yuba River Area of Analysis						
Browns Valley Irrigation District					5,000	3,100
Cordua Irrigation District						
Feather River Area of Analysis						
Butte Water District	5,750			5,750		
Garden Highway Mutual Water Company						
Gilsizer Slough Ranch						
Goose Club Farms and Teichert Aggregates	3,700			6,300		

Water Agency	April – June			July - September		
	Cropland Idling/Crop Shifting (acre-feet)	Stored Reservoir Release (acre-feet)	Conservation (acre-feet)	Cropland Idling/Crop Shifting (acre-feet)	Stored Reservoir Release (acre-feet)	Conservation (acre-feet)
South Sutter Water District					15,000	
Tule Basin Farms						
Merced River Area of Analysis						
Merced Irrigation District					30,000	
Delta Region Area of Analysis						
Reclamation District 2068	2,775			4,725		
Pope Ranch						
Total	67,119	0	0	110,243	97,000	3,100

2.4 Summary Comparison of Alternative Impacts

Tables 2-9 and 2-10 summarize the potential environmental impacts associated with each action alternative. The No Action/No Project Alternative considers the potential for changed conditions during the 2015-2024 period when transfers could occur, but because this period is relatively short, the analysis did not identify changes from existing conditions. Alternative 1 is therefore not included in the tables.

2.5 Environmentally Superior Alternative

As shown in Tables 2-9 and 2-10, the Proposed Action would not have any significant, unavoidable adverse impacts. Similarly, none of the alternatives have unavoidable significant impacts, although some of the alternatives could have less of an impact on some resources, as follows:

- Alternative 3, No Cropland Modifications, would reduce the environmental effects associated with cropland idling. Alternative 3 would not have the potential to affect ~~terrestrial resources~~vegetation and wildlife, particularly the giant garter snake, by idling rice fields and reducing habitat. It would also reduce effects to agricultural land use and economic effects to non-transferring parties.

- Alternative 4, No Groundwater Substitution, would reduce the environmental effects associated with groundwater substitution transfers. Alternative 4 would reduce effects to groundwater levels, quality, and land subsidence. It would also reduce effects associated with streamflow depletion, including potential effects to ~~aquatic resources~~fisheries, ~~terrestrial resources~~vegetation and wildlife, and water supply.

While the alternatives would affect different resources in different ways, none of the alternatives are considered to be the environmentally superior alternative. There are no unavoidable significant impacts associated with the Proposed Action that would otherwise be avoided or substantially reduced by an alternative, and each of the alternatives has its own unique set of environmental impacts which, on balance, would be a "trade-off" of environmental impacts in selecting any one alternative over another.

Table 2-9. Potential Impacts Summary

Potential Impact	Alternative	Significance to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
3.1 Water Supply				
Groundwater substitution transfers could decrease flows in surface water bodies following a transfer while groundwater basins recharge, which could decrease pumping at Jones and Banks Pumping Plants and/or require additional water releases from upstream CVP reservoirs.	2, 3	S	WS-1: Streamflow Depletion Factor	LTS
Water supplies on the rivers downstream of reservoirs could decrease following stored reservoir water transfers, but would be limited by the refill agreements	2, 3, 4	LTS	None	LTS
Changes in Delta diversions could affect Delta water levels ~~and cause local users' diversion pumps to be above the water surface.~~	2, 3, 4	LTS	None	LTS
Transfers would increase water supplies in the Buyers Service Area	2, 3, 4	B	None	B
3.2 Water Quality				
Cropland idling transfers could result in increased deposition of sediment on water bodies.	2, 4	LTS	None	LTS
Cropland idling/shifting transfers could change the water quality constituents associated with leaching and runoff.	2, 4	LTS	None	LTS
Cropland idling/shifting transfers could change the quantity of organic carbon in waterways.	2, 4	LTS	None	LTS
Groundwater substitution transfers could introduce contaminants that could enter surface waters from irrigation return flows.	2, 3	LTS	None	LTS

Potential Impact	Alternative	Significance to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Water transfers could change reservoir storage in CVP and SWP reservoirs and could result in water quality impacts.	2, 3, 4	LTS	None	LTS
Water transfers could change reservoir storage non-Project reservoirs participating in reservoir release transfers, which could result in water quality impacts.	2, 3, 4	LTS	None	LTS
Water transfers could change river flow rates in the Seller Service Area and could affect water quality.	2, 3, 4	LTS	None	LTS
Water transfers could change Delta inflows and could result in water quality impacts.	2, 3, 4	LTS	None	LTS
Water transfers could change Delta outflows and could result in water quality impacts.	2, 3, 4	LTS	None	LTS
Water transfers could change Delta salinity and could result in water quality impacts.	2, 3, 4	LTS	None	LTS
Diversion of transfer water at Banta Carbona ID, West Stanislaus ID, and Patterson ID could affect water quality in the Delta-Mendota Canal.	2, 3, 4	LTS	None	LTS
Use of transfer water in the Buyer Service Area could result in increased irrigation on drainage impaired lands in the Buyer Service Area which could affect water quality.	2, 3, 4	LTS	None	LTS
Water transfers could change reservoir storage in San Luis Reservoir and could result in water quality impacts.	2, 3, 4	LTS	None	LTS
3.3 Groundwater Resources				
Groundwater substitution transfers could cause a reduction in groundwater levels in the Seller Service Area.	2, 3	S	GW-1: Mitigation and Monitoring Plans	LTS

Potential Impact	Alternative	Significance to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Groundwater substitution transfers could cause subsidence in the Seller Service Area.	2, 3	S	GW-1: Mitigation and Monitoring Plans	LTS
Groundwater substitution transfers could cause changes to groundwater quality in the Seller Service Area.	2, 3	LTS	None	LTS
Cropland idling transfers could cause reduction in groundwater levels in the Seller Service Area due to decreased applied water recharge.	2, 4	LTS	None	LTS
Water transfers via cropland idling could cause groundwater level declines in the Seller Service Area that lead to permanent land subsidence or changes in groundwater quality.	2,4	LTS	None	LTS
Water transfers could reduce groundwater pumping during shortages in the Buyer Service Area, which could increase groundwater levels, decrease subsidence, and improve groundwater quality.	2, 3, 4	B	None	B
3.4 Geology and Soils				
Cropland idling transfers in the Seller Service Area that temporarily convert cropland to bare fields could increase soil erosion.	2, 4	LTS	None	LTS
Cropland idling water transfers could cause expansive soils in the Seller Service Area to shrink due to the reduction in applied irrigation water.	2, 4	LTS	None	LTS
Use of transfer water on agricultural fields in the Buyer Service Area could increase soil erosion.	2, 3, 4	LTS	None	LTS
Use of transfer water on agricultural fields in the Buyer Service Area could increase soil movement.	2, 3, 4	LTS	None	LTS

Potential Impact	Alternative	Significance to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Changes in streamflows in the Sacramento and San Joaquin Rivers and their tributaries as a result of water transfers could result in increased soil erosion.	2, 3, 4	LTS	None	LTS
3.5 Air Quality				
Increased groundwater pumping for groundwater substitution transfers would increase emissions of air pollutants in the Sellers Service Area.	2, 3	S	AQ-1: Reducing pumping to reduce emissions, AQ-2: Operate electric engines	LTS
Water transfers via cropland idling could reduce vehicle exhaust emissions from reduced operations in the Sellers Service Area.	2, 4	B	None	B
Water transfers via cropland idling would increase fugitive dust emissions from wind erosion of bare fields and decrease fugitive dust emissions associated with land preparation and harvesting in the Sellers Service Area.	2, 4	B	None	B
Use of water from transfers on agricultural fields in the Buyer Service Area could reduce windblown dust.	2, 3, 4	B	None	B
Water transfers via groundwater substitution and cropland idling could exceed the general conformity de minimis thresholds.	2, 3, 4	LTS	None	LTS
3.6 Climate Change				
Increased groundwater pumping for groundwater substitution transfers could increase emissions of greenhouse gases.	2, 3	LTS	None	LTS
Water transfers via cropland idling could reduce vehicle exhaust emissions from reduced operations in the study area.	2, 4	LTS	None	LTS
Changes to the environment from climate change could affect the action alternatives.	2, 3, 4	LTS	None	LTS

Potential Impact	Alternative	Significance to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Use of water from transfers on agricultural fields in the Buyer Service Area could affect emissions.	2, 3, 4	LTS	None	LTS
3.7 ~~Aquatic Resources~~Fisheries				
Transfer actions could affect reservoir storage and reservoir surface area in reservoirs supporting fisheries resources	2, 3, 4	LTS	None	LTS
Groundwater substitution could reduce stream flows supporting fisheries resources in small streams	2, 3	LTS	None	LTS
Transfer actions could ~~decrease~~ alter flows of rivers and creeks supporting fisheries resources in the Sacramento and San Joaquin river watersheds	2, 3, 4	LTS	None	LTS
Transfer actions could alter hydrologic conditions in the Delta, altering associated habitat availability and suitability	2, 3, 4	LTS	None	LTS
Transfer actions could affect the habitat of special-status species associated with mainstem rivers, tributaries, and the Delta.	2, 3, 4	not applicable	LTS	LTS
3.8 Vegetation and Wildlife				
Groundwater substitution could reduce groundwater levels supporting natural communities	2, 3	LTS	None	LTS
Groundwater substitution could reduce stream flows supporting natural communities in small streams	2, 3	S	GW-1	LTS
Cropland Idling/Shifting could alter habitat availability and suitability for upland species	2, 4	LTS	None	LTS
Transfer actions could impact reservoir storage and reservoir surface area and alter habitat availability and suitability associated with those reservoirs	2, 3, 4	LTS	None	LTS

Potential Impact	Alternative	Significance to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Transfers could reduce flows in large rivers in the Sacramento and San Joaquin River watersheds, altering habitat availability and suitability associated with these rivers	2, 3, 4	LTS	None	LTS
Transfer actions could alter hydrologic conditions in the Delta, altering associated habitat availability and suitability	2, 3, 4	LTS	None	LTS
Transfer actions could impact San Luis Reservoir storage and surface area.	2, 3, 4	LTS	None	LTS
Cropland idling/shifting under could alter the amount of suitable habitat for natural communities ~~and~~ , special-status wildlife species, and migratory birds associated with seasonally flooded agriculture and associated irrigation waterways	2, 4	LTS	None	LTS
Transfer actions could alter planting patterns and urban water use in the Buyer Service Area	2, 3, 4	LTS	Non	LTS
Transfers could affect wetlands that provide habitat for special status plant species.	2, 3, 4	LTS	None	LTS
Transfers could affect giant garter snake and Pacific pond turtle by reducing aquatic habitat.	2, 3, 4	LTS	None	LTS
Transfers could affect the San Joaquin kit fox by reducing available habitat.	2, 3, 4	LTS	None	LTS
Transfers could impact special status bird species and migratory birds.	2, 3, 4	LTS	None	LTS
3.9 Agricultural Land Use				
Cropland idling water transfers could ~~permanently or substantially~~ decrease the amount of lands categorized as Prime Farmland, Farmland of Statewide Importance, or Unique Farmland under the FMMP.	2	LTS	None	LTS

Potential Impact	Alternative	Significance to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
	4	S	Mitigation Measure LU-1: Avoiding changes in FMMP land use classifications	LTS
Cropland idling water transfers could convert agricultural lands under the Williamson Act and other land resource programs to an incompatible use.	2, 4	LTS	None	LTS
Cropland idling water transfers could conflict with local land use policies.	2, 4	NI	None	NI
Water transfers could provide water to irrigators in the Buyer Service Area to irrigate existing crop fields and maintain agricultural land uses.	2, 3, 4	B	B	B
3.13 Cultural Resources				
Transfers that draw down reservoir surface elevations beyond historically low levels could result in a potentially significant effect on cultural resources.	2, 3, 4	LTS	None	LTS
Stored reservoir release transfers that draw down reservoir surface elevations at local reservoirs beyond historically low levels could affect cultural resources.	2, 3, 4	LTS	None	LTS
3.14 Visual Resources				
Water transfers could degrade the existing landscape character or scenic attractiveness of Class A and B visual resources at CVP and SWP reservoirs	2, 3, 4	LTS	None	LTS
Water transfers could degrade the existing landscape character or scenic quality of Class A and B visual resources along surface water bodies	2, 3, 4	LTS	None	LTS
Stored reservoir release transfers could substantially degrade the existing landscape character or scenic attractiveness of Class A and B visual resources participating reservoirs	2, 3, 4	LTS	None	LTS

Potential Impact	Alternative	Significance to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Cropland idling transfers could substantially degrade the existing landscape character and scenic attractiveness of Class A and B visual resources	2, 4	LTS	None	LTS
Water transfers could substantially degrade the existing landscape character and quality in the Buyer's Service Area	2, 3, 4	LTS	None	LTS
3.15 Recreation				
Changes in surface water elevation at Shasta, Folsom, Merle Collins, Oroville, Camp Far West, and Lake McClure reservoirs as a result of water transfers could affect reservoir-based recreation.	2, 3, 4	LTS	None	LTS
Changes in surface water elevations at Hell Hole and French Meadows Reservoirs as a result of water transfers could affect reservoir-based recreation.	2, 3, 4	LTS	None	LTS
Changes in river flows from water transfers could affect river-based recreation on the Sacramento, Yuba, Feather, American, San Joaquin, and Merced rivers.	2, 3, 4	LTS	None	LTS
Changes in average flow into the Delta from the San Joaquin River from water transfers could affect river-based recreation.	2, 3, 4	NI	None	NI
Changes in surface water elevation at San Luis Reservoir as a result of water transfers could affect reservoir-based recreation	2, 3, 4	NI	None	NI
3.16 Power				
Acquisition of water via groundwater substitution or crop idling may cause changes in power generation from CVP and SWP reservoirs	2, 3, 4	LTS	None	LTS

Potential Impact	Alternative	Significance to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Acquisition of water via stored reservoir water may cause changes in power generation from the facilities that ~~sell~~ provide water	2, 3, 4	LTS	None	LTS
3.17 Flood Control				
Water transfers would change storage levels in CVP and SWP reservoirs, potentially affecting flood control	2, 3, 4	LTS	None	LTS
Water transfers ~~could~~ would ~~decrease~~ change storage levels in non-Project reservoirs and potentially affecting flood control	2, 3, 4	B	None	B
Water transfers could ~~change~~ increase river flows, potentially affecting flood capacity or levee stability	2, 3, 4	LTS	None	LTS
Water transfers would change storage at San Luis Reservoir, potentially affecting flood control	2, 3, 4	LTS	None	LTS

Key:
B = beneficial
LTS = less than significant
NCFEC = no change from existing conditions
NI = no impact
None = no feasible mitigation identified and/or required
S = significant

Table 2-10. Impacts for NEPA-Only Resources

Potential Impact	Alternative	Impact
3.10 Regional Economics		
Seller Service Area		
Revenues from cropland idling water transfers could increase incomes for farmers or landowners selling water.	2, 4	Beneficial
Cropland idling transfers in Glenn, Colusa, and Yolo counties could reduce employment, labor income, and economic output for businesses and households linked to agricultural activities.	2, 4	Employment: -492 Labor Income: -$19.38 Million Output: -$90.43 Million
Cropland idling transfers in Sutter and Butte counties could reduce economic output, value added, and employment for businesses and households linked to agricultural activities.	2, 4	Employment: -163 Labor Income: -$5.50 Million Output: -$26.76 Million
Cropland idling transfers in Solano County could reduce economic output, labor income, and employment for businesses and households linked to agricultural activities.	2, 4	Employment: -32 Labor Income: -$1.13 Million Output: -$4.58 Million
Cropland idling transfers could have adverse local economic effects.	2, 4	Adverse
Water transfers from idling alfalfa could increase costs for dairy and other livestock feed.	2, 4	Adverse, but minimal
Cropland idling transfers could decrease net revenues to tenant farmers whose landowners choose to participate in transfers.	2, 4	Adverse
Crop shifting transfers could change economic output, value added, and employment for businesses and households linked to agricultural activities.	2, 4	Adverse, but minimal
Crop shifting transfers could change economic output, value added, and employment for businesses and households linked to agricultural activities.	2, 4	Adverse, but minimal
Economic effects associated with cropland idling could conflict with economic policies and objectives set forth in local plans.	2, 4	Adverse
Economic effects associated with cropland idling could conflict with economic policies and objectives set forth in local plans.	2, 4	Adverse
Reductions in local sales associated with cropland idling transfer effects could reduce tax revenues and increase costs to county governments.	2, 4	Adverse, but minimal
Groundwater substitution transfers could increase groundwater pumping costs for water users in areas where groundwater levels decline as a result of the transfer.	2, 3	Adverse
Revenues from groundwater substitution water transfers could increase incomes for farmers or landowners selling water.	2, 3	Beneficial

Potential Impact	Alternative	Impact
Groundwater substitution water transfers could increase management costs for local water districts.	2, 3	Adverse
Revenues received from stored reservoir and conservation transfers could increase operating incomes for sellers.	2, 3, 4	Beneficial, but minimal
Buyer Service Area		
Water transfers would provide water for agricultural uses that could support revenues, economic output, and employment.	2, 3, 4	Beneficial
Water transfers would provide water for M&I uses that could support revenues, economic output, and employment.	2, 3, 4	Beneficial
3.11 Environmental Justice		
Cropland idling transfers could adversely and disproportionately affect minority and low-income farm workers in the Seller Service Area.	2, 4	No disproportionately high or adverse effect
Crop shifting transfers could adversely and disproportionately affect minority and low-income farm workers in the Seller Service Area.	2, 3	No disproportionately high or adverse effect
Use of cropland modification transfers could adversely and disproportionately affect minority and low-income farm workers in the Buyer Service Area.	2, 3, 4	Beneficial
3.12 Indian Trust Assets		
Groundwater substitution transfers could adversely affect ITAs by decreasing groundwater levels, which would potentially interfere with the exercise of a federally-reserved water right use, occupancy, and or character	2, 3	No effect
Groundwater substitution transfers could adversely affect ITAs by reducing the health of tribal members by decreasing water supplies	2, 3	No effect
Groundwater substitution transfers could affect ITAs by affecting fish and wildlife where there is a federally-reserved hunting, gathering, or fishing right.	2, 3	No effect
Groundwater substitution transfers could adversely affect ITAs by causing changes in stream flow temperatures or stream depletion, which would potentially interfere with the exercise of a federally-reserved Indian right	2, 3	No effect
Use of groundwater substitution transfers could affect reservations or Rancherias in the Buyer Service Area to reduce CVP shortages.	2, 3, 4	Beneficial

2.6 References

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