

## MITIGATED NEGATIVE DECLARATION FOR 2016 TEHAMA-COLUSA CANAL AUTHORITY IN BASIN WATER TRANSFERS

**LEAD AGENCY:** Tehama-Colusa Canal Authority  
PO Box 1025  
Willows, CA 95988

**AVAILABILITY OF DOCUMENTS:** The initial study for this mitigated negative declaration is available for review at: Tehama-Colusa Canal Authority, 5513 State Highway 162, Willows, CA 95988 and online at [http://www.usbr.gov/mp/nepa/nepa\\_projdetails.cfm?Project\\_ID=24324](http://www.usbr.gov/mp/nepa/nepa_projdetails.cfm?Project_ID=24324).

Questions or comments regarding this mitigated negative declaration and initial study may be addressed to:

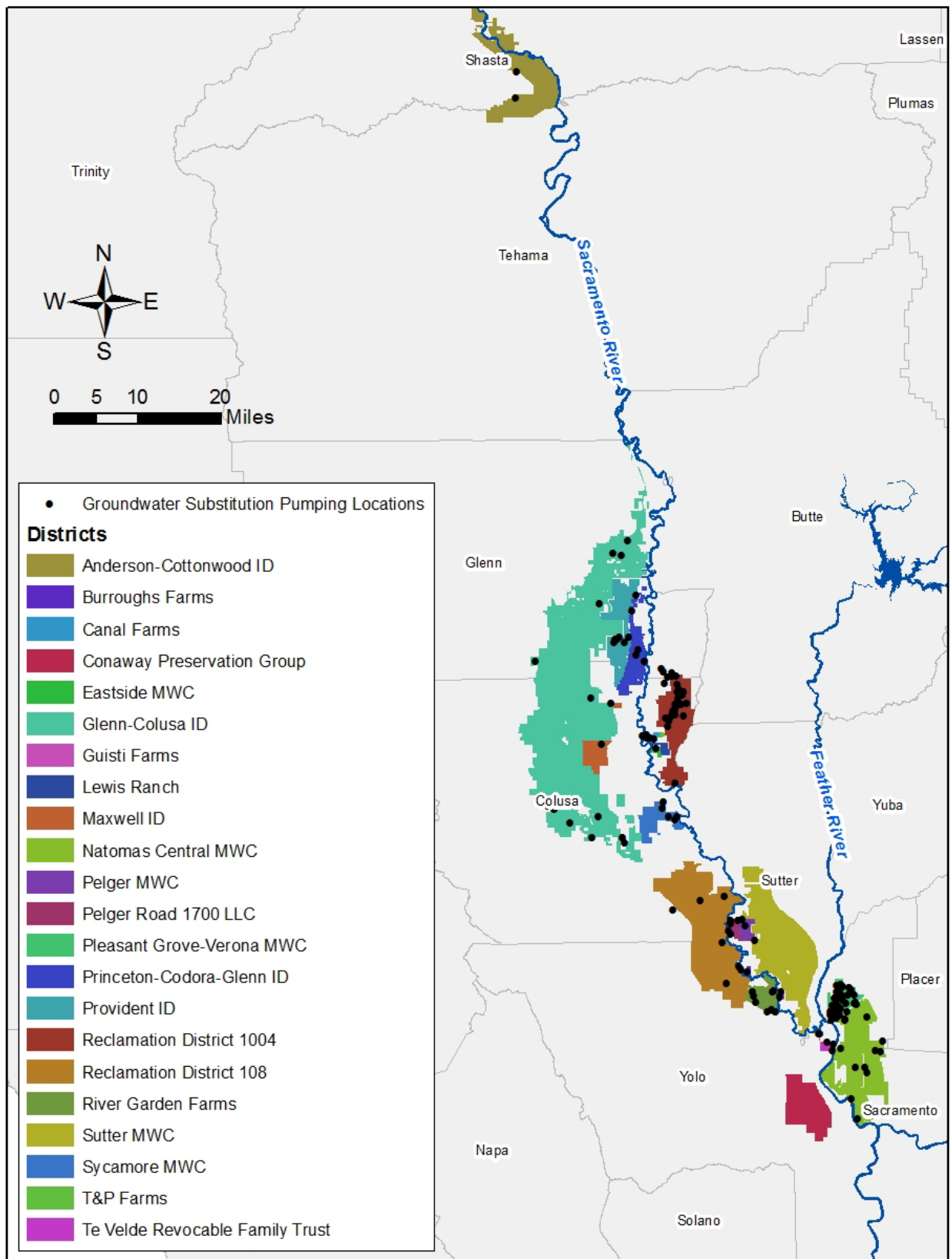
Tehama-Colusa Canal Authority  
Attention: Mr. Jeff Sutton  
PO Box 1025  
Willows, CA 95988  
Fax (530) 934-2355 or e-mail: [jsutton@tccanal.com](mailto:jsutton@tccanal.com)

**Project Description:** Multi-year extreme drought conditions have led the Tehama-Colusa Canal Authority (TCCA) and its Member Units to solicit willing sellers to transfer water in 2016. A number of entities have expressed interest in transferring water to the Member Units of the TCCA. The TCCA would negotiate with these sellers, on behalf of the Member Units, to identify potential transfers and the specifics of each transfer arrangement, which, collectively, constitute the "proposed project" addressed in the Initial Study. Transfers would be from willing sellers within the Sacramento Valley to buyers within the Sacramento Valley. This Mitigated Negative Declaration is based on the Environmental Assessment/Initial Study (EA/IS) that analyzes these water transfers. The water would be made available for transfer through a combination of cropland idling and groundwater substitution.

**Project Location:** The proposed transfers could originate in Colusa, Glenn, Sacramento, Shasta, Sutter, Tehama, or Yolo Counties from sellers shown on the map on the next page. The transfer buyers could be in Colusa, Glenn, Tehama, or Yolo Counties.

**Findings:** An initial study was prepared to assess the proposed transfers' potential effects on the environment and the significance of those impacts. Based on the initial study, the TCCA has determined that the proposed project will not have a significant impact on the environment. This conclusion is supported by the following findings:

- The project will not result in impacts to agriculture and forestry resources, cultural resources, hazards and hazardous materials, land use and planning, mineral resources, population and housing, public services, recreation, transportation/traffic, and utilities and service systems
- The project will result in less than significant impacts to aesthetics, air quality, biological resources, geology and soils, greenhouse gas emissions, hydrology and water quality, and noise.



**Potential Selling Entities**

**Mitigation Measures:** The initial study incorporated the following mitigation measures:

- AQ-1 – Selling agency would reduce pumping at diesel wells to reduce emissions to below the thresholds. If an agency is transferring water through cropland idling and groundwater substitution in the same year, the reduction in vehicle emissions can partially offset groundwater substitution pumping at a rate of 4.25 acre-feet (AF) of water produced by idling to one acre-foot of groundwater pumped. Agencies may also decide to replace old diesel wells to reduce emission below the thresholds.

If a selling agency, through the actions above, can reduce daily emissions below thresholds while operating wells 24 hours per day, then that agency must provide an analysis to Reclamation. This analysis should identify that all wells proposed for participation in a 2016 Water Transfer may be operated on a 24-hour per day basis without exceeding emission thresholds.

Alternately, if a selling agency with potentially significant emissions, as determined by this EA/IS, intends to operate wells less than 24 hours per day to reduce emissions below the thresholds, then that agency will be required to maintain recordkeeping logs that document the specific engine to be used for groundwater substitution transfers, the power rating (hp), and applicable emission factors. Emission calculations for daily emissions will be completed for comparison to the significance thresholds determined for each selling agency. The recordkeeping logs will be sent to Reclamation monthly for verification that emissions are within the allowable limits.

Reclamation will also work with the water agencies to inform individual growers of incentive funding available through the Natural Resources Conservation Service's Environmental Quality Incentives Program. Funded conservation practices include the replacement of internal combustion engines in irrigation pumps; therefore, the program may be used by growers to further reduce criteria pollutant emissions.

- GW-1: Monitoring Program and Mitigation Plan  
The objective of Mitigation Measure GW-1 is to avoid significant adverse environmental effects and ensure prompt corrective action in the event unanticipated effects occur. The measure accomplishes this by monitoring groundwater and/or surface water levels during transfers to avoid potential effects. The objectives of this process are to: (1) minimize potential effects to other legal users of water; (2) provide a process for review and response to reported effects to non-transferring parties; (3) assure that a local mitigation strategy is in place prior to the groundwater transfer; and (4) mitigate significant adverse environmental effects. Reclamation will verify that sellers adopt and implement these mitigation measures to avoid potentially significant adverse effects of transfer-related groundwater extraction. In addition, each entity participating in a groundwater substitution transfer must confirm that the proposed groundwater pumping will be compatible with state and local regulations and Groundwater Management Plans (GMPs). As Groundwater Sustainability Plans (GSPs) are developed by Groundwater Sustainability Agencies, potential sellers must confirm that the proposed pumping is compatible with applicable GSPs.

### **Well Review Process**

Potential sellers will be required to submit well data for Reclamation and, where appropriate, DWR review, as part of the transfer approval process. Required information will be detailed in the most current version of the *DRAFT Technical Information for Preparing Water Transfer Proposals*.

## Monitoring Program

Potential sellers will be required to complete and implement a monitoring program subject to Reclamation's approval that must, at a minimum, include the following components:

- o *Monitoring Well Network.* The monitoring program shall incorporate a sufficient number of monitoring wells, as determined by Reclamation and the sellers in relation to local conditions, to accurately characterize groundwater levels and response in the area before, during, and after transfer pumping takes place. Depending on local conditions, additional groundwater level monitoring may be required near ecological resource areas.
- o *Groundwater Pumping Measurements.* All wells pumping to replace surface water designated for transfer shall be configured with a permanent instantaneous and totalizing flow meter capable of accurately measuring well discharge rates and volumes. Flow meter readings will be recorded just prior to initiation of pumping and at designated times, but no less than monthly and as close as practical to the last day of the month, throughout the duration of the transfer.
- o *Groundwater Levels.* Sellers will collect measurements of groundwater levels in both participating transfer wells and monitoring wells. Groundwater level monitoring will include measurements before, during and after transfer-related pumping. The seller will measure groundwater levels as follows:
  - Prior to transfer: Groundwater levels will be measured monthly from March in the year of the proposed transfer-related pumping until the start of the transfer (where possible).
  - Start of transfer: Groundwater levels will be measured on the same day that the transfer-related pumping begins, prior to the pump being turned on.
  - During transfer-related pumping: Groundwater levels will be measured weekly throughout the transfer-related pumping period, unless site specific information indicates a different interval should be used.
  - Post-transfer pumping: Groundwater levels will be measured weekly for one month after the end of transfer-related pumping, after which groundwater levels will be measured monthly through March of the year following the transfer.

Sellers thus monitor effects to groundwater levels that may result from the proposed transfer and avoid significant impacts. The primary criteria used to identify potentially significant impacts to groundwater levels are the BMOs set by GMPs. In the Sacramento Valley, several counties have established GMPs to provide guidance in managing the resource.

In areas where quantitative BMOs do not exist, Reclamation, TCCA, and the potential seller(s) will coordinate closely with potentially impacted third parties to collect and monitor groundwater data. If a third party expects that it may be impacted by a proposed transfer, that party should contact Reclamation and the seller with its concern. The burden of collecting groundwater data will not be the responsibility of the third party. If warranted, groundwater level monitoring to

address the third-party's concern may be incorporated in the monitoring and mitigation plans required by Mitigation Measure GW-1.

Additionally, to avoid significant effects to vegetation and allow sellers to modify actions before significant effects occur, sellers will monitor groundwater depth data to verify that significant adverse effects to deep-rooted vegetation are avoided. If monitoring data indicate that water levels have dropped below root zones (i.e., more than 10 feet where groundwater was 10 to 25 feet below ground surface prior to starting the transfer of surface water made available from groundwater substitution actions), the seller must implement actions set forth in the mitigation plan. If historic data show that groundwater elevations in the area of transfer have typically varied by more than this amount annually during the proposed transfer period, then the transfer may be allowed to proceed. If there is no deep-rooted vegetation (i.e., oak trees and riparian trees that would have tap roots greater than 10 feet deep) within one-half mile of the transfer wells or the vegetation is located along waterways that will continue to have water during the transfer, the transfer may be allowed to proceed. If no existing monitoring points exist in the shallow aquifer, monitoring would be based on visual observations of the health of these areas of deep-rooted vegetation. If significant adverse impacts to deep-rooted vegetation (that is, loss of a substantial percentage of the deep-rooted vegetation as determined by Reclamation based on site-specific circumstances in consultation with a qualified biologist) occur as a result of the transfer despite the monitoring efforts and implementation of the mitigation plan, the seller will prepare a report documenting the result of the restoration activity to plant, maintain, and monitor restoration of vegetation for 5 years to replace the losses.

- o *Groundwater Quality.* For municipal sellers, the comprehensive water quality testing requirements of Title 22 should be sufficient for the water transfer monitoring program. Agricultural sellers shall measure specific conductance in samples from each participating production well. Samples shall be collected when the seller first initiates pumping, monthly during the transfer period, and at the termination of transfer pumping.
- o *Land Subsidence.* Subsidence monitoring will be required if groundwater levels could decline below historic low levels during the proposed water transfer. Before a transfer, each seller will examine local groundwater conditions and groundwater level changes based on past pumping events or groundwater substitution transfers. This existing information will be the basis to estimate if groundwater levels are likely to decline below historic low levels, which would trigger land surface elevation measurements (as described below).

If the measured groundwater level falls below the historic low level, the seller must confirm the measurement within seven days. If the water level has risen above the historic low level, the seller may continue transfer pumping. If the measured groundwater level remains below the historic low level, the seller will stop transfer-related pumping immediately or begin land surface elevation measurements in strategic locations within and/or near the transfer-related pumping area. Measurements may include (1) extensometer monitoring, (2) continuous GPS monitoring, or (3) extensive land-elevation benchmark surveys conducted by a licensed surveyor. This data could be collected by the seller or from other sources (such as public extensometer data). Measurements must be completed on a monthly basis during the transfer.

If the land surface elevation survey indicates an elevation decrease between 0.1 foot and 0.2 foot from the initial measurement, the seller could have significant impacts and would need to start the process identified below in the Mitigation Plan. The seller will also work with Reclamation to assess the accuracy of the survey measurements based on current limitations of technology, professional engineering/surveying judgment, and any other data available in or near the transferring area.

The threshold of 0.1 foot was chosen as this value is typical of the elastic (i.e., recoverable) portion of subsidence; the threshold of 0.2 foot was selected considering limitations of current land survey technology.

- o *Coordination Plan.* The monitoring program will include a plan to coordinate the collection and organization of monitoring data. This plan will describe how input from third parties will be incorporated into the monitoring program, and will include a plan for communication with Reclamation as well as other decision makers and third parties.
- o *Evaluation and Reporting.* The proposed monitoring program will describe the method of reporting monitoring data. At a minimum, sellers will provide data summary tables to Reclamation, both during and after transfer-related groundwater pumping. Post-program reporting will continue through March of the year following the transfer. Sellers will provide a final summary report to Reclamation evaluating the effects of the water transfer. The final report will identify transfer-related effects on groundwater and surface water (both during and after pumping), and the extent and significance, if any, of effects on local groundwater users. It shall include groundwater elevation contour maps for the area in which transfer operations are located, showing pre-transfer groundwater elevations, groundwater elevations at the end of the transfer, and recovered groundwater elevations in March of the year following the transfer. The summary report shall also identify the extent and significance, if any, of transfer-related effects to ecological resources such as fish, wildlife, and vegetation resources.

### **Mitigation Plan**

Potential sellers must complete and implement a mitigation plan to avoid potentially significant groundwater impacts and ensure prompt corrective action in the event unanticipated effects occur. Mitigation actions could include:

- o Curtailment of pumping until natural recharge corrects the issue.
- o Lowering of pumping bowls in non-transferring wells affected by transfer pumping.
- o Reimbursement for significant increases in pumping costs due to the additional groundwater pumping to support the transfer.
- o Curtailment of pumping until water levels rise above historic lows if non-reversible subsidence is detected (based on local data to identify elastic versus inelastic subsidence).
- o Reimbursement for modifications to infrastructure that may be affected by non-reversible subsidence.
- o Other actions as appropriate.

As summarized above, the purpose of Mitigation Measure GW-1 is to monitor groundwater levels during transfers to avoid potentially significant adverse effects. The mitigation plan will describe how to avoid significant effects and address any significant effects that occur despite the monitoring efforts. The objectives of this process are to: (1) minimize potential effects to other legal users of water; (2) provide a process for review and response to reported effects; and (3) assure that a local mitigation strategy is in place prior to the groundwater transfer. Accordingly, to ensure that mitigation plans will be feasible, effective, and tailored to local conditions, the plan must include the following elements:

- o A procedure for the seller to receive reports of purported environmental or effects to non-transferring parties;
- o A procedure for investigating any reported effect;
- o Development of mitigation options, in cooperation with the affected parties, for legitimate significant effects; and
- o Assurances that adequate financial resources are available to cover reasonably anticipated mitigation needs.

Mitigation to avoid potentially significant subsidence impacts and ensure prompt corrective action in the event that unanticipated effects occur is described by the following stages.

#### *Stage 1: Groundwater Levels*

Irreversible subsidence would not occur if groundwater levels stay above historic low levels for the entire transfer season. As groundwater is pumped from an aquifer, the pore water pressure in the aquifer is reduced. This reduction in pore water pressure increases the effective stress on the structure of the aquifer itself. This increase in effective stress can cause the aquifer structure to deform, or compress, resulting in the subsidence of the ground surface elevation. Subsidence can be irreversible if the reduced effective stress is lower than the historically low effective stress. Typically this would be the result of groundwater levels reaching levels lower than the historical low level.

Before a transfer, each seller will examine local groundwater conditions and groundwater level changes based on past pumping events or groundwater substitution transfers. This existing information will be the basis to estimate if groundwater levels are likely to decline below historic low levels as a result of the proposed transfer. If the pre-transfer assessment indicates that groundwater levels will stay above historic low levels, and this finding is confirmed by monitoring during the transfer-related pumping period, then no additional actions for subsidence monitoring or mitigation are necessary. Sellers would need to proceed to stage 2 for land surface elevation monitoring if the pre-transfer estimates indicate that groundwater levels are anticipated to decline below historic low levels. If monitoring during the transfer-related pumping period (confirmed by two measurements within seven days) indicates that groundwater levels have fallen below historic low levels, sellers must immediately stop pumping from transfer wells in the area that is affected or proceed to stage 2.

#### *Stage 2: Ground Surface Elevations*

Stage 2 includes monthly ground surface monitoring during transfer-related pumping if pumping could cause groundwater levels to fall below historic low levels, as described

above in the Monitoring Plan. If ground surface elevations decrease between 0.1 and 0.2 foot, the seller will evaluate the accuracy of the information based on the current limitations of technology, professional engineering/surveying judgment, and other local data. If the elevations decline more than 0.2 foot, this change could indicate inelastic subsidence, which would trigger a shift to Stage 3.

#### *Stage 3: Local Investigation*

If the threshold of 0.2 foot of ground surface elevation change is exceeded, the seller shall cease groundwater substitution pumping for the transfer until one of the following occurs: (1) groundwater levels recover above historic low groundwater levels; (2) seller completes a more detailed local investigation identifying hydrogeologic conditions that could potentially allow continued transfer-related pumping from a subset of wells (if the seller can provide evidence that this pumping is not expected to cause additional subsidence); or (3) seller completes an investigation of local infrastructure that could be affected by subsidence (such as water delivery infrastructure, water supply facilities, flood protection facilities, highways, etc.) indicating the local threshold of subsidence that could be experienced before these facilities would be adversely affected. Any option should also consider the effect of non-transfer pumping that may be causing subsidence.

#### *Stage 4: Mitigation*

If subsidence effects to local infrastructure occur despite monitoring efforts, then the sellers must work with the lead agencies to determine whether the measured subsidence may be caused by transfer-related pumping. Any significant adverse subsidence effects caused by transfer pumping activities must be addressed. A contingency plan must be developed in the event that a need for further corrective action is necessary. This contingency plan must be approved by Reclamation before transfer-related pumping could continue after Stage 3.

#### *Stage 5: Continued Monitoring*

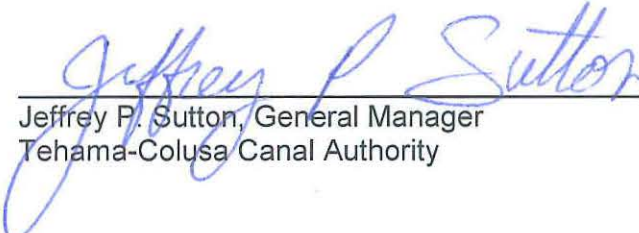
The sellers will continue to monitor for subsidence while groundwater levels remain below historic low levels. If the seller has ceased transfer-related pumping but groundwater levels remain below historic lows, subsidence monitoring will need to continue until the spring following the transfer. The results of subsidence monitoring will be factored into monitoring and mitigation plans for future transfers.

### **MANDATORY FINDINGS OF SIGNIFICANCE**

- No substantial evidence exists that the proposed project would have a negative or adverse effect on the environment.
- The project would not substantially degrade the quality of the environment, significantly reduce the habitat for fish and wildlife species, result in fish or wildlife populations below a self-sustaining level, reduce the number or restrict the range of a special-status species, or eliminate important examples of California history or prehistory.
- The project would not have environmental effects that would cause substantial direct or indirect adverse effects on humans.
- The project would not have environmental effects that are individually limited but cumulatively considerable.

In accordance with Section 21082.1 of the California Environmental Quality Act, the TCCA staff has independently reviewed and analyzed the initial study (attached) and proposed mitigated

negative declaration for the proposed project and finds that the initial study and proposed mitigated negative declaration reflect the independent judgment of the TCCA staff.

  
\_\_\_\_\_  
Jeffrey P. Sutton, General Manager  
Tehama-Colusa Canal Authority

  
\_\_\_\_\_  
Date



**Notice of Completion & Environmental Document Transmittal**

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613  
 For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH #

**Project Title:** 2016 Tehama-Colusa Canal Authority Water Transfers

Lead Agency: Tehama-Colusa Canal Authority

Contact Person: Jeff Sutton

Mailing Address: P.O. Box 1025

Phone: (530) 934-2125

City: Willows

Zip: 95988

County: Glenn

**Project Location:** County: Multiple - see project description City/Nearest Community: Multiple - see project description

Cross Streets: N/A - interagency water transfer

Zip Code: \_\_\_\_\_

Longitude/Latitude (degrees, minutes and seconds): 39 ° 31 ' 27.1 " N / 122 ° 13 ' 8.5 " W Total Acres: N/A

Assessor's Parcel No.: N/A - interagency water transfer

Section: \_\_\_\_\_

Twp.: \_\_\_\_\_

Range: \_\_\_\_\_

Base: \_\_\_\_\_

Within 2 Miles: State Hwy #: \_\_\_\_\_

Waterways: \_\_\_\_\_

Airports: \_\_\_\_\_

Railways: \_\_\_\_\_

Schools: \_\_\_\_\_

**Document Type:**CEQA: ☐ NOP☐ Draft EIRNEPA: ☐ NOIOther: ☒ Joint Document☐ Early Cons☐ Supplement/Subsequent EIR☒ EA☐ Final Document☐ Neg Dec

(Prior SCH No.) \_\_\_\_\_

☐ Draft EIS☐ Other: \_\_\_\_\_☒ Mit Neg Dec

Other: \_\_\_\_\_

☐ FONSI**Local Action Type:**☐ General Plan Update☐ Specific Plan☐ Rezone☐ Annexation☐ General Plan Amendment☐ Master Plan☐ Prezone☐ Redevelopment☐ General Plan Element☐ Planned Unit Development☐ Use Permit☐ Coastal Permit☐ Community Plan☐ Site Plan☐ Land Division (Subdivision, etc.)☒ Other: water transfer**Development Type:**☐ Residential: Units \_\_\_\_\_ Acres \_\_\_\_\_☐ Office: Sq.ft. \_\_\_\_\_ Acres \_\_\_\_\_ Employees \_\_\_\_\_☐ Commercial: Sq.ft. \_\_\_\_\_ Acres \_\_\_\_\_ Employees \_\_\_\_\_☐ Industrial: Sq.ft. \_\_\_\_\_ Acres \_\_\_\_\_ Employees \_\_\_\_\_☐ Educational: \_\_\_\_\_☐ Recreational: \_\_\_\_\_☐ Water Facilities: Type \_\_\_\_\_ MGD \_\_\_\_\_☐ Transportation: Type \_\_\_\_\_☐ Mining: Mineral \_\_\_\_\_☐ Power: Type \_\_\_\_\_ MW \_\_\_\_\_☐ Waste Treatment: Type \_\_\_\_\_ MGD \_\_\_\_\_☐ Hazardous Waste: Type \_\_\_\_\_☒ Other: interagency water transfer**Project Issues Discussed in Document:**☐ Aesthetic/Visual☐ Fiscal☐ Recreation/Parks☒ Vegetation☐ Agricultural Land☐ Flood Plain/Flooding☐ Schools/Universities☒ Water Quality☒ Air Quality☐ Forest Land/Fire Hazard☐ Septic Systems☒ Water Supply/Groundwater☐ Archeological/Historical☐ Geologic/Seismic☐ Sewer Capacity☒ Wetland/Riparian☒ Biological Resources☐ Minerals☐ Soil Erosion/Compaction/Grading☐ Growth Inducement☐ Coastal Zone☐ Noise☐ Solid Waste☐ Land Use☐ Drainage/Absorption☐ Population/Housing Balance☐ Toxic/Hazardous☒ Cumulative Effects☒ Economic/Jobs☐ Public Services/Facilities☐ Traffic/Circulation☐ Other: \_\_\_\_\_**Present Land Use/Zoning/General Plan Designation:**

Seller actions will occur on agricultural property and water will be transferred to agricultural buyers.

**Project Description:** (please use a separate page if necessary)

This Mitigated Negative Declaration and IS/EA analyzes environmental impacts of proposed water transfers from willing sellers to buyers in the Sacramento Valley to help address water shortages. This environmental document includes transfers of Central Valley Project (CVP) water from entities in northern California to participating members of the Tehama-colusa Canal Authority. The water would be made available for transfer through a combination of cropland idling and groundwater substitution. The transfers could originate in Colusa, Glenn, Sacramento, Shasta, Sutter, Tehama, or Yolo counties. The transfer buyers could be in Colusa, Glenn, Tehama, or Yolo counties.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

## Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with an "X".  
If you have already sent your document to the agency please denote that with an "S".

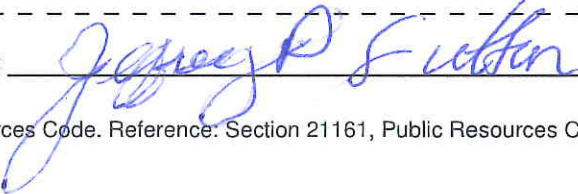
|                                                                      |                                                                              |
|----------------------------------------------------------------------|------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> Air Resources Board              | <input type="checkbox"/> Office of Historic Preservation                     |
| <input type="checkbox"/> Boating & Waterways, Department of          | <input type="checkbox"/> Office of Public School Construction                |
| <input type="checkbox"/> California Emergency Management Agency      | <input type="checkbox"/> Parks & Recreation, Department of                   |
| <input type="checkbox"/> California Highway Patrol                   | <input type="checkbox"/> Pesticide Regulation, Department of                 |
| <input type="checkbox"/> Caltrans District # _____                   | <input type="checkbox"/> Public Utilities Commission                         |
| <input type="checkbox"/> Caltrans Division of Aeronautics            | <input type="checkbox"/> Regional WQCB # _____                               |
| <input type="checkbox"/> Caltrans Planning                           | <input type="checkbox"/> Resources Agency                                    |
| <input type="checkbox"/> Central Valley Flood Protection Board       | <input type="checkbox"/> Resources Recycling and Recovery, Department of     |
| <input type="checkbox"/> Coachella Valley Mtns. Conservancy          | <input type="checkbox"/> S.F. Bay Conservation & Development Comm.           |
| <input type="checkbox"/> Coastal Commission                          | <input type="checkbox"/> San Gabriel & Lower L.A. Rivers & Mtns. Conservancy |
| <input type="checkbox"/> Colorado River Board                        | <input type="checkbox"/> San Joaquin River Conservancy                       |
| <input type="checkbox"/> Conservation, Department of                 | <input type="checkbox"/> Santa Monica Mtns. Conservancy                      |
| <input type="checkbox"/> Corrections, Department of                  | <input type="checkbox"/> State Lands Commission                              |
| <input type="checkbox"/> Delta Protection Commission                 | <input type="checkbox"/> SWRCB: Clean Water Grants                           |
| <input type="checkbox"/> Education, Department of                    | <input checked="" type="checkbox"/> SWRCB: Water Quality                     |
| <input type="checkbox"/> Energy Commission                           | <input checked="" type="checkbox"/> SWRCB: Water Rights                      |
| <input checked="" type="checkbox"/> Fish & Game Region # <u>1,2</u>  | <input type="checkbox"/> Tahoe Regional Planning Agency                      |
| <input type="checkbox"/> Food & Agriculture, Department of           | <input type="checkbox"/> Toxic Substances Control, Department of             |
| <input type="checkbox"/> Forestry and Fire Protection, Department of | <input type="checkbox"/> S Water Resources, Department of                    |
| <input type="checkbox"/> General Services, Department of             |                                                                              |
| <input type="checkbox"/> Health Services, Department of              | Other: _____                                                                 |
| <input type="checkbox"/> Housing & Community Development             | Other: _____                                                                 |
| <input type="checkbox"/> Native American Heritage Commission         |                                                                              |

### Local Public Review Period (to be filled in by lead agency)

Starting Date February 4, 2016 Ending Date March 7, 2016

### Lead Agency (Complete if applicable):

|                                                      |                       |
|------------------------------------------------------|-----------------------|
| Consulting Firm: <u>CDM Smith</u>                    | Applicant: _____      |
| Address: <u>1755 Creekside Oaks Drive, Suite 200</u> | Address: _____        |
| City/State/Zip: <u>Sacramento, CA 95833</u>          | City/State/Zip: _____ |
| Contact: <u>Carrie Buckman</u>                       | Phone: _____          |
| Phone: <u>916-567-9900</u>                           |                       |

Signature of Lead Agency Representative:  Date: 2-3-16

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

## INITIAL STUDY FOR 2016 TEHAMA-COLUSA CANAL AUTHORITY WATER TRANSFERS

1. Project title: 2016 Tehama-Colusa Canal Authority Water Transfers
2. Lead agency name and address: Tehama-Colusa Canal Authority  
PO Box 1025  
Willows, CA 95988
3. Contact person and phone number: Mr. Jeff Sutton, (530) 934-2125
4. Project location: The proposed transfers could originate in Colusa, Glenn, Sacramento, Shasta, Sutter, Tehama, or Yolo counties. The transfer buyers could be in Colusa, Glenn, Tehama, or Yolo counties.
5. Project sponsor's name and address: Same as Lead Agency.
6. General plan designation: Not Applicable – Interagency Agricultural Water Transfers
7. Zoning: All lands with potential to participate in the transfers are agricultural.
8. Description of project: (Describe the whole action involved, including but not limited to later phases of the project, and any secondary, support, or off-site features necessary for its implementation. Attach additional sheets if necessary.)  
Refer to Chapter 2 of the Initial Study.
9. Surrounding land uses and setting: Briefly describe the project's surroundings:  
Refer to Chapter 2 of the Initial Study.
10. Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.)  
The Tehama-Colusa Canal Authority will coordinate with their Member Units and the sellers identified in this Initial Study. Transfer negotiations will occur between the Authority and interested sellers. Reclamation approval is required for transfer of water subject to Reclamation contract and use of Central Valley Project facilities. As a Federal agency, Reclamation does not complete CEQA compliance; however, Reclamation will verify that buyers and sellers have complied with CEQA in accordance with Central Valley Project Improvement Act requirements. Chapter 2 describes the involvement of State agencies, including the California Department of Water Resources and State Water Resources Control Board.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

- |                                                   |                                                             |                                                             |
|---------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|
| <input type="checkbox"/> Aesthetics               | <input type="checkbox"/> Agriculture and Forestry Resources | <input type="checkbox"/> Air Quality                        |
| <input type="checkbox"/> Biological Resources     | <input type="checkbox"/> Cultural Resources                 | <input type="checkbox"/> Geology /Soils                     |
| <input type="checkbox"/> Greenhouse Gas Emissions | <input type="checkbox"/> Hazards & Hazardous Materials      | <input type="checkbox"/> Hydrology / Water Quality          |
| <input type="checkbox"/> Land Use / Planning      | <input type="checkbox"/> Mineral Resources                  | <input type="checkbox"/> Noise                              |
| <input type="checkbox"/> Population / Housing     | <input type="checkbox"/> Public Services                    | <input type="checkbox"/> Recreation                         |
| <input type="checkbox"/> Transportation/Traffic   | <input type="checkbox"/> Utilities / Service Systems        | <input type="checkbox"/> Mandatory Findings of Significance |

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature

*Jeffrey P. Sutton*

Date

*2-3-16*

Signature

Date

# **Public Draft Environmental Assessment/Initial Study**

## **2016 Tehama-Colusa Canal Authority Water Transfers**

**California**



**U.S. Department of the Interior  
Bureau of Reclamation  
Sacramento, California**

**Tehama-Colusa Canal Authority  
Willows, California**

**February 2016**



# Contents

|                  |                                                |            |
|------------------|------------------------------------------------|------------|
| <b>Chapter 1</b> | <b>Introduction.....</b>                       | <b>1-1</b> |
| 1.1              | Background .....                               | 1-2        |
| 1.2              | Need for Proposal and Project Objectives ..... | 1-3        |
| 1.3              | Document Structure .....                       | 1-3        |
| <b>Chapter 2</b> | <b>Alternatives.....</b>                       | <b>2-1</b> |
| 2.1              | No Action.....                                 | 2-1        |
| 2.2              | Proposed Action/Proposed Project .....         | 2-1        |
| 2.2.1            | Sellers.....                                   | 2-4        |
| 2.2.2            | Buyers .....                                   | 2-6        |
| 2.2.3            | Potential Water Transfer Methods .....         | 2-7        |
| 2.3              | Environmental Commitments .....                | 2-10       |
| 2.4              | Environmental Setting .....                    | 2-12       |
| 2.4.1            | Aesthetics .....                               | 2-12       |
| 2.4.2            | Air Quality .....                              | 2-12       |
| 2.4.3            | Biological Resources .....                     | 2-14       |
| 2.4.4            | Geology and Soils.....                         | 2-17       |
| 2.4.5            | Greenhouse Gas Emissions.....                  | 2-17       |
| 2.4.6            | Hydrology and Water Quality.....               | 2-18       |
| 2.4.7            | Noise .....                                    | 2-22       |
| <b>Chapter 3</b> | <b>Environmental Impacts .....</b>             | <b>3-1</b> |
| I.               | Aesthetics.....                                | 3-1        |
| II.              | Agriculture and Forest Resources.....          | 3-2        |
| III.             | Air Quality .....                              | 3-4        |
| IV.              | Biological Resources .....                     | 3-16       |
| V.               | Cultural Resources.....                        | 3-30       |
| VI.              | Geology and Soils.....                         | 3-31       |
| VII.             | Greenhouse Gas Emissions .....                 | 3-33       |
| VIII.            | Hazards and Hazardous Materials .....          | 3-36       |
| IX.              | Hydrology and Water Quality .....              | 3-37       |
| X.               | Land Use and Planning.....                     | 3-62       |
| XI.              | Mineral Resources .....                        | 3-63       |
| XII.             | Noise .....                                    | 3-64       |
| XIII.            | Population and Housing.....                    | 3-65       |
| XIV.             | Public Services .....                          | 3-66       |
| XV.              | Recreation.....                                | 3-66       |
| XVI.             | Transportation/Traffic .....                   | 3-67       |
| XVII.            | Utilities and Service Systems .....            | 3-68       |
| XVIII.           | Mandatory Findings of Significance .....       | 3-69       |

|                  |                                                                  |            |
|------------------|------------------------------------------------------------------|------------|
| <b>Chapter 4</b> | <b>Other Federal Environmental Compliance Requirements .....</b> | <b>4-1</b> |
| 4.1              | Indian Trust Assets (ITAs).....                                  | 4-1        |
| 4.2              | Indian Sacred Sites.....                                         | 4-3        |
| 4.3              | Socioeconomics .....                                             | 4-3        |
| 4.4              | Environmental Justice.....                                       | 4-7        |
| 4.5              | Consultation and Coordination .....                              | 4-9        |
| 4.5.1            | 2016 Stakeholder Involvement .....                               | 4-9        |
| 4.5.2            | Resource Agency Involvement .....                                | 4-9        |
| 4.5.3            | Public Comments .....                                            | 4-10       |
| <b>Chapter 5</b> | <b>References .....</b>                                          | <b>5-1</b> |

## Tables

|                                                                                                                            |      |
|----------------------------------------------------------------------------------------------------------------------------|------|
| Table 2-1. Maximum Potential Transfer by Seller (AF).....                                                                  | 2-2  |
| Table 2-2. Potential Transfer Types by Seller Based on 100 Percent of Contract Total<br>(Upper Limits in AF).....          | 2-5  |
| Table 2-3. Potential Transfer Types by Seller Based on 25 Percent Reduction to<br>Contract Total (Upper Limits in AF)..... | 2-6  |
| Table 2-4. Potential Buyers.....                                                                                           | 2-7  |
| Table 2-5. Estimated ETAW Values for Crops Suitable for Idling or Shifting.....                                            | 2-9  |
| Table 2-6. State and Federal Attainment Status.....                                                                        | 2-14 |
| Table 2-7. Fish Species of Management Concern .....                                                                        | 2-16 |
| Table 2-8. Summary of Dry Wells Reported in 2014 and 2015 .....                                                            | 2-21 |
| Table 2-9. Typical Noise Levels Associated with Farm Equipment .....                                                       | 2-22 |
| Table 3-1. CEQA Operational Significance Thresholds.....                                                                   | 3-6  |
| Table 3-2. Unmitigated Peak Daily Emissions (lbs/day).....                                                                 | 3-7  |
| Table 3-3. Unmitigated Annual Emissions (tons per year).....                                                               | 3-7  |
| Table 3-4. Mitigated Peak Daily Emissions (lbs/day) .....                                                                  | 3-9  |
| Table 3-5. General Conformity Applicability Evaluation (tons per year) .....                                               | 3-14 |
| Table 3-6. Annual Harvested Rice Acreage by County in Sellers' Area.....                                                   | 3-21 |
| Table 3-7. Summary of Project GHG Emissions (MTCO <sub>2e</sub> per year) .....                                            | 3-35 |
| Table 3-8. Water Transfers through Groundwater Substitution under the Proposed<br>Action .....                             | 3-47 |
| Table 3-9. Potential Cumulative Sellers (Upper Limits) .....                                                               | 3-71 |
| Table 3-10. Historic Cross Delta Water Transfers (2009 – 2015).....                                                        | 3-73 |
| Table 4-1. Summary of 2013 Regional Economy in Glenn, Colusa, Sutter, and Yolo<br>Counties .....                           | 4-4  |
| Table 4-2. 2012 Demographics and Income in Transferring Counties.....                                                      | 4-7  |
| Table 4-3. Farm Employment, 2003-2013.....                                                                                 | 4-8  |

## Figures

|                                                                                                                                               |      |
|-----------------------------------------------------------------------------------------------------------------------------------------------|------|
| Figure 2-1. Potential Selling Entities .....                                                                                                  | 2-3  |
| Figure 2-2. Cumulative Annual Change in Storage as Simulated by the USGS's Central<br>Valley Hydrologic Model .....                           | 2-19 |
| Figure 2-3. Cumulative Annual Change in Storage as simulated by DWR's Central<br>Valley Groundwater-Surface Water Simulation Model .....      | 2-20 |
| Figure 3-1. Location of CO Maintenance Area in Seller Service Area .....                                                                      | 3-10 |
| Figure 3-2. Location of O <sub>3</sub> Nonattainment Area in Seller Service Area .....                                                        | 3-11 |
| Figure 3-3. Location of PM <sub>10</sub> Maintenance Area in Seller Service Area .....                                                        | 3-12 |
| Figure 3-4. Location of PM <sub>2.5</sub> Nonattainment Area in Seller Service Area .....                                                     | 3-13 |
| Figure 3-5. Simulated Change in Water Table Elevation (0 to approximately 35 feet<br>bgs), Based on September 1977 Hydrologic Conditions..... | 3-42 |

|                                                                                                                                           |      |
|-------------------------------------------------------------------------------------------------------------------------------------------|------|
| Figure 3-6. Simulated Change in Groundwater Head (approximately 200 to 300 bgs),<br>Based on September 1977 Hydrologic Conditions .....   | 3-43 |
| Figure 3-7. Simulated Change in Groundwater Head (approximately 300 to 400 bgs),<br>Based on September 1977 Hydrologic Conditions .....   | 3-44 |
| Figure 3-8. Simulated Change in Groundwater Head (approximately 700 to 900 bgs),<br>Based on September 1977 Hydrologic Conditions .....   | 3-45 |
| Figure 3-9. Simulated Groundwater Table Elevation (0 to approximately 70 feet bgs) at<br>Location 21 (See Figure 3-12 for Location) ..... | 3-50 |
| Figure 3-10. Simulated Groundwater Head (approximately 480 to 690 feet bgs) at<br>Location 21 (See Figure 3-12 for Location) .....        | 3-51 |
| Figure 3-11. Simulated Groundwater Head (approximately 690 to 910 feet bgs) at<br>Location 21 (See Figure 3-12 for Location) .....        | 3-52 |
| Figure 3-12. Simulated Change in Groundwater Head at Location 21 (See Figure 3-5<br>for Location) under the Proposed Action .....         | 3-53 |
| Figure 3-13. Measured Ground Surface Displacement (in feet) at Extensometer<br>22N02W15C002M in Glenn County .....                        | 3-57 |
| Figure 4-1. Groundwater Effects to ITAs in the Sacramento Valley Groundwater Basin .....                                                  | 4-2  |

## Appendices

|            |                                                         |
|------------|---------------------------------------------------------|
| Appendix A | Special Status Wildlife Species with Potential to Occur |
| Appendix B | Special Status Plant Species with Potential to Occur    |
| Appendix C | Groundwater Existing Conditions                         |
| Appendix D | Air Quality Emissions Calculations                      |
| Appendix E | Greenhouse Gas Emissions Calculations                   |
| Appendix F | Groundwater Modeling Results                            |

# Abbreviations and Acronyms

|                   |                                                            |
|-------------------|------------------------------------------------------------|
| 2010-2011 WTP EA  | 2010-2011 Water Transfer Program Environmental Assessment  |
| AF                | acre-feet                                                  |
| APCD              | Air Pollution Control District                             |
| AQAP              | Air Quality Attainment Plan                                |
| AQMD              | Air Quality Management District                            |
| ATCM              | Airborne Toxic Control Measure                             |
| BA                | Biological Assessment                                      |
| bgs               | below ground surface                                       |
| BMOs              | Basin Management Objectives                                |
| BO                | biological opinion                                         |
| C2VSim            | Central Valley Groundwater-Surface Water Simulation Model  |
| CAAQS             | California Ambient Air Quality Standards                   |
| CARB              | California Air Resources Board                             |
| CCR               | California Code of Regulations                             |
| CEQA              | California Environmental Quality Act                       |
| CFR               | Code of Federal Regulations                                |
| cfs               | cubic feet per second                                      |
| CH <sub>4</sub>   | methane                                                    |
| CO                | carbon monoxide                                            |
| CO <sub>2</sub>   | carbon dioxide                                             |
| CO <sub>2</sub> e | carbon dioxide equivalent                                  |
| CVHM              | Central Valley Hydrologic Model                            |
| CVP               | Central Valley Project                                     |
| CVPIA             | Central Valley Project Improvement Act                     |
| dB                | decibels                                                   |
| dBA               | A-weighted decibels                                        |
| DFW               | Department of Fish and Wildlife                            |
| DWR               | Department of Water Resources                              |
| EA                | Environmental Assessment                                   |
| EDD               | Employment Development Department                          |
| eGRID             | Emissions & Generation Resource Integrated Database        |
| EIS/EIR           | Environmental Impact Statement/Environmental Impact Report |
| ESA               | Endangered Species Act                                     |
| ETAW              | evapotranspiration of applied water                        |

|                   |                                          |
|-------------------|------------------------------------------|
| FONSI             | Finding of No Significant Impact         |
| GGs               | giant garter snake                       |
| GHG               | greenhouse gas                           |
| GIS               | geographic information system            |
| GMPs              | Groundwater Management Plans             |
| GSPs              | Groundwater Sustainability Plans         |
| GWP               | global warming potential                 |
| HCP               | Habitat Conservation Plans               |
| hp                | horsepower                               |
| ID                | Irrigation District                      |
| IS                | Initial Study                            |
| ITAs              | Indian Trust Assets                      |
| Ldn               | day-night average sound level            |
| MCL               | maximum contaminant level                |
| mg/L              | milligrams per liter                     |
| N <sub>2</sub> O  | nitrous oxide                            |
| NAAQS             | National Ambient Air Quality Standards   |
| NCCP              | Natural Community Conservation Plans     |
| NEPA              | National Environmental Policy Act        |
| NMFS              | National Marine Fisheries Service        |
| NO <sub>x</sub>   | nitrogen oxides                          |
| NRCS              | Natural Resources Conservation Service   |
| NSVPA             | Northern Sacramento Valley Planning Area |
| O <sub>3</sub>    | ozone                                    |
| PM <sub>10</sub>  | inhalable particulate matter             |
| PM <sub>2.5</sub> | fine particulate matter                  |
| SACFEM2013        | Sacramento Valley Groundwater Model      |
| SIP               | state implementation plan                |
| SLDMWA            | San Luis & Delta-Mendota Water Authority |
| SWP               | State Water Project                      |
| SWRCB             | State Water Resources Control Board      |
| TCCA              | Tehama-Colusa Canal Authority            |
| TCR               | The Climate Registry                     |
| TDS               | total dissolved solids                   |
| TUCP              | temporary urgency change petition        |
| USC               | United States Code                       |
| USDA              | U.S. Department of Agriculture           |
| USEPA             | U.S. Environmental Protection Agency     |

|       |                                |
|-------|--------------------------------|
| USFWS | U.S. Fish and Wildlife Service |
| USGS  | U.S. Geological Survey         |
| VOC   | volatile organic compound      |
| WY    | water year                     |

*This page left blank intentionally.*

# Chapter 1

## Introduction

This Environmental Assessment (EA) and Initial Study (IS) for water transfers in contract year 2016<sup>1</sup> was prepared by the U.S. Department of the Interior, Bureau of Reclamation (Reclamation) and the Tehama-Colusa Canal Authority (TCCA). This joint EA/IS document satisfies the requirements of the National Environmental Policy Act (NEPA) (42 United States Code [USC] §4231 et seq.), the Council of Environmental Quality implementing regulations (40 Code of Federal Regulations [CFR] §1500-1508), the Department of the Interior's NEPA regulations (43 CFR Part 46), the California Environmental Quality Act (CEQA), and the Governor's Office of Planning and Research regulations to implement CEQA (Sections 15000-15387 of the California Code of Regulations). Reclamation is the federal lead agency responsible for NEPA review, through the EA, for the proposed 2016 TCCA water transfers, and the TCCA is the state lead agency responsible for CEQA review, through the IS, for the proposed 2016 TCCA water transfers.

This EA/IS describes the potential direct, indirect, and cumulative effects of transferring water from willing sellers, resulting from actions taken by the sellers to make water available for transfer, to the Member Units of the TCCA. The sellers hold water rights on northern California waterways or contracts with the United States (for Base Supply<sup>2</sup> and Central Valley Project (CVP) Water<sup>3</sup> ("Project Water")). This EA/IS also identifies measures that have been incorporated to minimize or avoid project-related impacts. The transfers included in this document are only those involving Project Water or Base Supply or CVP facilities. These transfers would require approval from Reclamation, which necessitates compliance with NEPA. These transfers would also require CEQA compliance for the buyers and sellers.

Other transfers not involving the TCCA and its Member Units could occur during the same time period. The San Luis & Delta-Mendota Water Authority (SLDMWA) and Reclamation completed an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) on Long-Term Water

---

<sup>1</sup> Water Service Contract Year is March 1, 2016 through February 28, 2017. Sacramento River Settlement Contract Year is April 1, 2016 through October 31, 2016.

<sup>2</sup> Article 1(b) of the Sacramento River Settlement Contract defines Base Supply as the quantity of Surface Water established in Articles 3 and 5 which may be diverted by the Contractor from its Source of Supply each month during the period April through October of each Year without payment to the United States for such quantities diverted.

<sup>3</sup> Article 1(n) of the Sacramento River Settlement Contract defines Project water as all Surface Water diverted or scheduled to be diverted each month during the period April through October of each Year by the Contractor from its Source of Supply which is in excess of the Base Supply.

Transfers from 2015 to 2024 (Reclamation and SLDMWA 2015). The EIS/EIR includes some of the same water sources but the water would be transferred to different potential buyers; that is, the sellers have only the amounts of water listed in Chapter 2 available for transfer, but the water could be purchased by SLDMWA or TCCA members. SLDMWA may purchase water from sources in addition to those described in Chapter 2. Also, State Water Project (SWP) contractors may engage in water transfers to augment supply.

## 1.1 Background

The TCCA and its Member Units may experience severe water shortages in 2016 and are soliciting willing sellers to transfer surface water. A number of entities that use surface water from the Sacramento River have expressed interest in transferring water to Member Units of the TCCA. The TCCA would negotiate with these sellers, on behalf of the Member Units, to identify potential transfers and the specifics of each transfer arrangement, which, collectively, constitute the “proposed project” to be addressed under CEQA. The TCCA and these willing sellers are using this EA/IS to inform decision-makers and the public of the potential environmental effects of the proposed water transfers and determine whether the transfers may result in significant environmental impacts that warrant the preparation of an Environmental Impact Report under CEQA. Because of the extremely dry conditions, the environment and agricultural community are already being impacted; this EA/IS focuses on the incremental impacts beyond those already anticipated.

To facilitate the transfer of water throughout the State, Reclamation is considering whether it should approve and facilitate water transfers between willing sellers and buyers when Base Supply, Project Water, or CVP facilities are involved in the transfer. Reclamation will not take part in the transfer negotiation process, nor will Reclamation develop a “program” to connect buyers and sellers. Reclamation would focus on the approval and facilitation of individual transfers of water involving Base Supply and/or Project Water or involving CVP facilities; these transfers constitute the “proposed action” to be addressed under NEPA. Reclamation is using this EA/IS to evaluate the potential environmental effects of the proposed action and determine whether it may result in significant environmental impacts.

Transfers would occur from sellers in the Sacramento River area to buyers that receive water from the Tehama-Colusa or Corning Canals, which divert Project Water<sup>4</sup> from the Sacramento River at the Red Bluff Pumping Plant. To deliver transferred water to Member Units of the TCCA, Reclamation may reoperate CVP facilities to change the pattern of water releases from storage and may also request the California Department of Water Resources (DWR) to reoperate

---

<sup>4</sup> Article 1(u) of the Water Service Contract defines Project Water as all water that is developed, diverted, stored, or delivered by the Secretary in accordance with the statutes authorizing the Project and in accordance with the terms and conditions of water rights acquired pursuant to California law.

SWP facilities. Reclamation would review and approve, as appropriate, proposed water transfers in accordance with the *DRAFT Technical Information for Preparing Water Transfer Proposals* (Reclamation and DWR 2015), state law, and the *Draft Interim Guidelines for Implementation of the Water Transfer Provisions of the Central Valley Project Improvement Act* (Title 34 of Public Law 102-575).

## 1.2 Need for Proposal and Project Objectives

The historic dry conditions from 2012 through 2015 have depleted storage reserves for the CVP and caused concerns about potential deliveries in water year 2016. For example, storage in Shasta Reservoir was about 1,431,000 acre-feet (AF) on January 3, 2016, which is about 55 percent of average at this time of year (Reclamation 2016). While it is too early in the 2016 water year to estimate CVP deliveries, the delivery restrictions in the past several years have caused concern for the TCCA Member Units that they may not have adequate supplies to maintain their permanent crops.

If Reclamation reduces water supplies in response to decreased storage, the TCCA is in need of approximately 82,000 AF of water to irrigate permanent crops to prevent the long-term impacts of allowing these crops to die. Reclamation's need is to review and approve (if appropriate) the transfer of Base Supply or Project Water that may require the use of CVP facilities, consistent with state and federal law, the Sacramento River Settlement Contract, and the *Interim Guidelines for Implementation of the Water Transfer Provisions of the Central Valley Project Improvement Act* (Title 34 of Public Law 102-575).

## 1.3 Document Structure

To consider environmental impacts of the Proposed Action pursuant to both NEPA and CEQA, Chapter 3 includes the analysis of possible effects to resources using an initial study checklist adapted from the CEQA Guidelines, Appendix G. Discussion of potential impacts for the No Action Alternative and Proposed Action are addressed in more detail following each checklist section. The CEQA Checklist does not incorporate all resource areas required by NEPA; Chapter 4 includes NEPA-specific components.

*This page left blank intentionally.*

## Chapter 2 Alternatives

### 2.1 No Action

For the No Action Alternative, the TCCA, on behalf of the Member Units, would not buy water from willing sellers that required Reclamation approval during contract year 2016. Agricultural and urban water users anticipate shortages in the absence of water transfers because of the multi-year drought and low water reserves entering 2016. If supplies are reduced, users may take alternative water supply actions in response to shortages, including increased groundwater pumping, cropland idling, reduction of landscape irrigation, or water rationing. Water users may also seek to transfer water from others, which may require additional NEPA or CEQA analysis. In the absence of transfers, growers may not have enough water to meet demands, and some permanent crops could be lost.

### 2.2 Proposed Action/Proposed Project

The Proposed Action and Proposed Project (referred to herein as the Proposed Action) is the transfer of surface water in contract year 2016 to the Member Units of the TCCA. Reclamation has approval authority over potential transfers of Base Supply and Project Water, or transfers that involve the use of CVP facilities.

The Proposed Action includes potential transfers of up to 82,000 AF of surface water from 22 entities, listed in Table 2-1 and shown in Figure 2-1, to TCCA Member Units. (Figure 2-1 shows selling agencies, but individual farms that could sell water are not included.) These transfers also include transfers between “common landowners” that own land in multiple water districts that may want to move water between different parcels to preserve permanent crops. If dry conditions persist, TCCA may not be able to obtain the full 82,000 AF through transfers. Table 2-1 shows potential upper limits for transfers if Sacramento River Settlement Contractors receive 100 percent of the Contract Total<sup>1</sup>, or if the Contract Total is reduced by 25 percent. This list represents those agencies with whom the TCCA may negotiate the transfer of water. For analytical purposes, the full 82,000 AF is assumed to be available; however, it is not possible to determine which negotiations would be successful, what combination of sellers would ultimately transfer water to the TCCA, or how

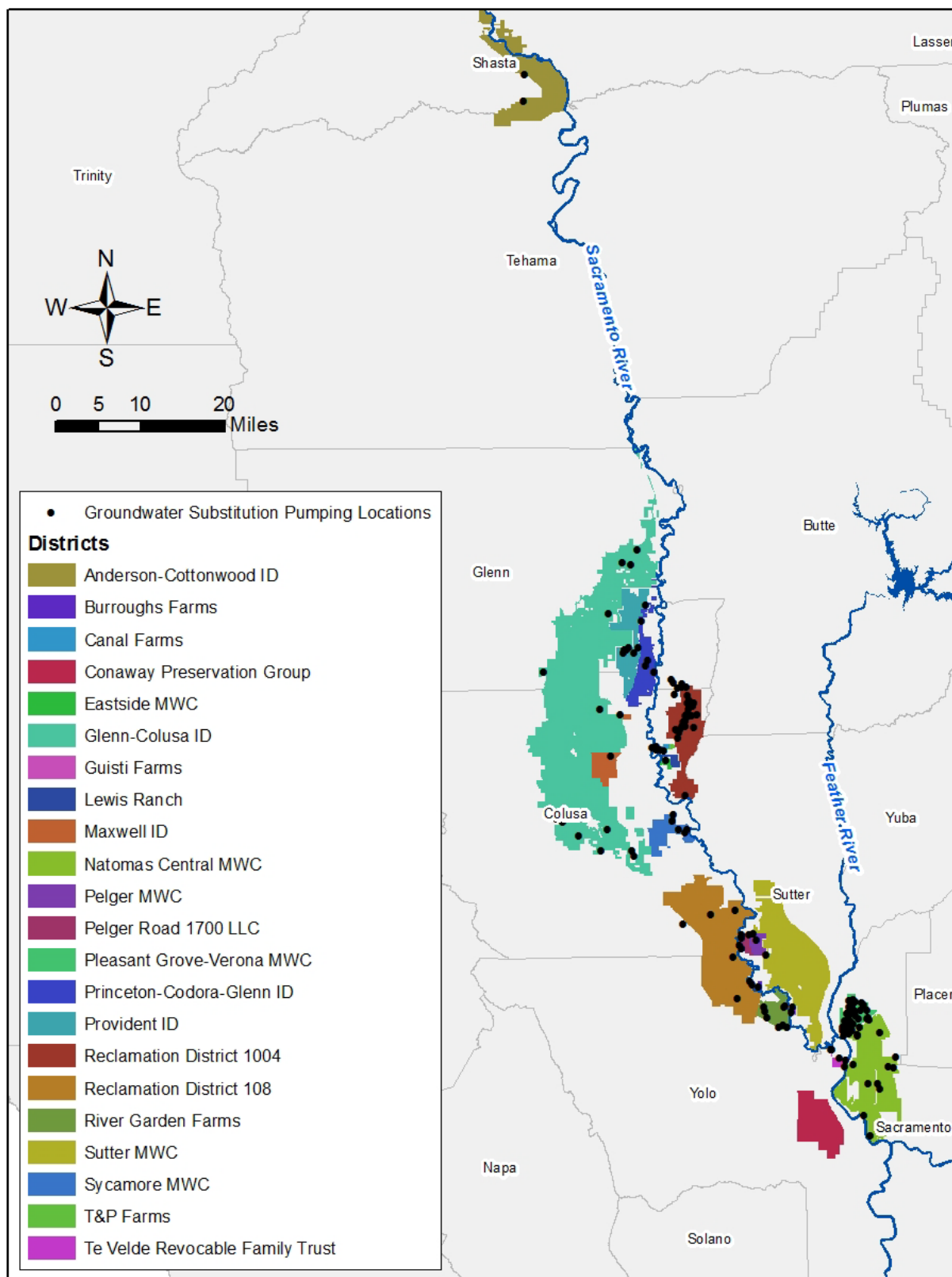
---

<sup>1</sup> Contract Total is defined as the sum of the Base Supply and Project Water available for diversion by the Contractor for the period April 1 through October 31.

much water would ultimately be transferred to the TCCA. For this reason, modeling and environmental analysis considers the quantities provided in Table 2-1 for 100 percent supplies to display the impacts that would be associated with transfers from each seller. These transfers add up to more than the TCCA's transfer demand of 82,000 AF, so the analysis provides a conservative description of potential environmental impacts by assessing impacts of all potential transfers moving forward when TCCA would only acquire a subset of these transfers.

**Table 2-1. Maximum Potential Transfer by Seller (AF)**

| <b>Water Agency</b>                        | <b>Maximum Transfer Based on 100 Percent of Contract Total</b> | <b>Maximum Transfer Based on 25 Reduction to Contract Total</b> |
|--------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------------|
| Anderson-Cottonwood Irrigation District    | 4,800                                                          | 4,800                                                           |
| Burroughs Farms                            | 2,000                                                          | 2,000                                                           |
| Canal Farms                                | 1,000                                                          | 1,000                                                           |
| Conaway Preservation Group                 | 21,350                                                         | 16,014                                                          |
| Eastside Mutual Water Company              | 2,230                                                          | 2,000                                                           |
| Giusti Farms                               | 1,000                                                          | 1,000                                                           |
| Glenn-Colusa Irrigation District           | 44,300                                                         | 44,300                                                          |
| Lewis Ranch                                | 2,310                                                          | 2,310                                                           |
| Maxwell Irrigation District                | 8,000                                                          | 8,000                                                           |
| Natomas Central Mutual Water Company       | 20,000                                                         | 20,000                                                          |
| Pelger Mutual Water Company                | 4,670                                                          | 4,000                                                           |
| Pelger Road 1700 LLC                       | 4,400                                                          | 4,400                                                           |
| Pleasant Grove-Verona Mutual Water Company | 15,000                                                         | 15,000                                                          |
| Princeton-Codora-Glenn Irrigation District | 12,100                                                         | 12,100                                                          |
| Provident Irrigation District              | 16,900                                                         | 16,900                                                          |
| Reclamation District 108                   | 35,000                                                         | 35,000                                                          |
| Reclamation District 1004                  | 19,675                                                         | 14,780                                                          |
| River Garden Farms                         | 16,000                                                         | 16,000                                                          |
| Sutter Mutual Water Company                | 18,000                                                         | 10,000                                                          |
| Sycamore Mutual Water Company              | 15,000                                                         | 15,000                                                          |
| T&P Farms                                  | 1,200                                                          | 1,170                                                           |
| Te Velde Revocable Family Trust            | 5,387                                                          | 4,473                                                           |
| <b>Total</b>                               | <b>270,322</b>                                                 | <b>250,247</b>                                                  |



**Figure 2-1. Potential Selling Entities**

Reclamation would evaluate each proposal individually, as it is received, to determine if it meets state law and Central Valley Project Improvement Act (CVPIA) requirements. Reclamation has followed this process in past years when approving transfers (such as when approving water transfers in 2013, 2014, and 2015). Reclamation may reoperate CVP facilities to change the pattern of water releases from storage to deliver transferred water to TCCA Member Units; DWR may also reoperate SWP facilities to help facilitate delivery of transferred water.

### **2.2.1 Sellers**

Table 2-1 lists agencies that have expressed interest in making water available for transfer in 2016 and the maximum transfer amounts if Sacramento River Settlement Contractors receive 100 percent of the Contract Total, or if the Contract Total is reduced by 25 percent. Table 2-2 shows the methodology by which the sellers could make water available for transfer if they receive full CVP water supplies. Because of the hydrologic conditions, many agencies are uncertain about which transfer type would be used, and have therefore included potential upper limits for both types of transfers in Table 2-2. While the entity making water available could use one or a combination of methods for making water available, or may shift the quantity made available during a particular period, the overall amount transferred would not exceed the values in Table 2-1. As discussed above, these transfer quantities are assessed in this EA/IS to allow transfers to move forward if Reclamation can deliver 100 percent of water supplies. This analysis is conservative because these larger transfer quantities would have greater potential for environmental impact than the smaller transfer quantities based on water supplies less than 100 percent.

Because the hydrology for the remainder of the season is uncertain, Table 2-3 shows the maximum transfer amounts for each transfer type if water supplies from Reclamation are reduced by 25 percent in a Critical Year. Similar to Table 2-2, sellers in both of these tables have included multiple transfer types to allow flexibility, but the overall amount transferred would not exceed the values in Table 2-1. The quantities of surface water made available through groundwater substitution proposed for the April to June period and the July to October period, as shown in Tables 2-2 and 2-3, may be shifted between those periods.

The majority of the surface water would be transferred between April and September, but a small amount of water could also be transferred in October to provide irrigation after harvest, when needed. Generally, groundwater substitution transfers could provide some water in October; however, the overall amount of water made available would not change. If water were made available in October, the overall totals from April through October would still stay within the upper limits provided in Table 2-1.

**Table 2-2. Potential Transfer Types by Seller Based on 100 Percent of Contract Total  
(Upper Limits in AF)**

| <b>Water Agency</b>                        | <b>April – June<br/>Groundwater<br/>Substitution</b> | <b>April – June<br/>Cropland<br/>Idling/Crop<br/>Shifting</b> | <b>July – October<br/>Groundwater<br/>Substitution</b> | <b>July – October<br/>Cropland<br/>Idling/Crop<br/>Shifting</b> |
|--------------------------------------------|------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------|-----------------------------------------------------------------|
| Anderson-Cottonwood Irrigation District    | 2,400                                                | 0                                                             | 2,400                                                  | 0                                                               |
| Burroughs Farms                            | 1,000                                                | 0                                                             | 1,000                                                  | 0                                                               |
| Canal Farms                                | 575                                                  | 235                                                           | 425                                                    | 400                                                             |
| Conaway Preservation Group                 | 0                                                    | 7,900                                                         | 0                                                      | 13,450                                                          |
| Eastside Mutual Water Company              | 1,067                                                | 683                                                           | 1,163                                                  | 1,163                                                           |
| Giusti Farms                               | 500                                                  | 0                                                             | 500                                                    | 0                                                               |
| Glenn-Colusa Irrigation District           | 5,650                                                | 12,210                                                        | 5,650                                                  | 20,790                                                          |
| Lewis Ranch                                | 0                                                    | 855                                                           | 0                                                      | 1,455                                                           |
| Maxwell Irrigation District                | 1,000                                                | 2,000                                                         | 2,000                                                  | 3,000                                                           |
| Natomas Central Mutual Water Company       | 10,000                                               | 0                                                             | 10,000                                                 | 0                                                               |
| Pelger Mutual Water Company                | 2,000                                                | 939                                                           | 2,670                                                  | 1,599                                                           |
| Pelger Road 1700 LLC                       | 2,200                                                | 0                                                             | 2,200                                                  | 0                                                               |
| Pleasant Grove-Verona Mutual Water Company | 8,000                                                | 3,330                                                         | 7,000                                                  | 5,670                                                           |
| Princeton-Codora-Glenn Irrigation District | 2,500                                                | 2,442                                                         | 3,000                                                  | 4,158                                                           |
| Provident Irrigation District              | 3,500                                                | 3,663                                                         | 3,500                                                  | 6,237                                                           |
| Reclamation District 108                   | 7,500                                                | 7,400                                                         | 7,500                                                  | 12,600                                                          |
| Reclamation District 1004                  | 0                                                    | 4,625                                                         | 7,175                                                  | 7,875                                                           |
| River Garden Farms                         | 5,000                                                | 3,700                                                         | 5,000                                                  | 6,300                                                           |
| Sutter Mutual Water Company                | 0                                                    | 6,660                                                         | 0                                                      | 11,340                                                          |
| Sycamore Mutual Water Company              | 4,000                                                | 2,590                                                         | 4,000                                                  | 4,410                                                           |
| T&P Farms                                  | 650                                                  | 330                                                           | 550                                                    | 560                                                             |
| Te Velde Revocable Family Trust            | 2,700                                                | 2,581                                                         | 4,394                                                  | 4,394                                                           |
| <b>Total<sup>1</sup></b>                   | <b>60,242</b>                                        | <b>62,143</b>                                                 | <b>70,127</b>                                          | <b>105,401</b>                                                  |

Note:

<sup>1</sup> 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 2-1 reflects the total upper limit for each agency.

**Table 2-3. Potential Transfer Types by Seller Based on 25 Percent Reduction to Contract Total (Upper Limits in AF)**

| <b>Water Agency</b>                        | <b>April – June<br/>Groundwater<br/>Substitution</b> | <b>April – June<br/>Cropland<br/>Idling/Crop<br/>Shifting</b> | <b>July – October<br/>Groundwater<br/>Substitution</b> | <b>July – October<br/>Cropland<br/>Idling/Crop<br/>Shifting</b> |
|--------------------------------------------|------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------|-----------------------------------------------------------------|
| Anderson-Cottonwood Irrigation District    | 2,400                                                | 0                                                             | 2,400                                                  | 0                                                               |
| Burroughs Farms                            | 1,000                                                | 0                                                             | 1,000                                                  | 0                                                               |
| Canal Farms                                | 575                                                  | 235                                                           | 425                                                    | 400                                                             |
| Conaway Preservation Group                 | 0                                                    | 5,925                                                         | 0                                                      | 10,089                                                          |
| Eastside Mutual Water Company              | 1,067                                                | 548                                                           | 933                                                    | 933                                                             |
| Guisti Farms                               | 500                                                  | 0                                                             | 500                                                    | 0                                                               |
| Glenn-Colusa Irrigation District           | 5,650                                                | 12,210                                                        | 5,650                                                  | 20,790                                                          |
| Lewis Ranch                                | 0                                                    | 855                                                           | 0                                                      | 1,455                                                           |
| Maxwell Irrigation District                | 1,000                                                | 2,000                                                         | 2,000                                                  | 3,000                                                           |
| Natomas Central Mutual Water Company       | 10,000                                               | 0                                                             | 10,000                                                 | 0                                                               |
| Pelger Mutual Water Company                | 2,000                                                | 704                                                           | 2,000                                                  | 1,199                                                           |
| Pelger Road 1700 LLC                       | 2,200                                                | 0                                                             | 2,200                                                  | 0                                                               |
| Pleasant Grove-Verona Mutual Water Company | 8,000                                                | 3,330                                                         | 7,000                                                  | 5,670                                                           |
| Princeton-Codora-Glenn Irrigation District | 2,500                                                | 2,442                                                         | 3,000                                                  | 4,158                                                           |
| Provident Irrigation District              | 3,500                                                | 3,663                                                         | 3,500                                                  | 6,237                                                           |
| Reclamation District 108                   | 7,500                                                | 7,400                                                         | 7,500                                                  | 12,600                                                          |
| Reclamation District 1004                  | 0                                                    | 3,470                                                         | 5,400                                                  | 5,910                                                           |
| River Garden Farms                         | 5,000                                                | 3,700                                                         | 5,000                                                  | 6,300                                                           |
| Sutter Mutual Water Company                | 0                                                    | 3,700                                                         | 0                                                      | 6,300                                                           |
| Sycamore Mutual Water Company              | 4,000                                                | 2,590                                                         | 4,000                                                  | 4,410                                                           |
| T&P Farms                                  | 750                                                  | 247                                                           | 420                                                    | 420                                                             |
| Te Velde Revocable Family Trust            | 1,950                                                | 573                                                           | 975                                                    | 975                                                             |
| <b>Total<sup>1</sup></b>                   | <b>59,592</b>                                        | <b>53,592</b>                                                 | <b>63,903</b>                                          | <b>90,846</b>                                                   |

Note:

<sup>1</sup> 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 2-1 reflects the total upper limit for each agency.

## 2.2.2 Buyers

Table 2-4 identifies entities that may be interested in buying transfer water. Not all of these potential buyers may end up actually purchasing water from the sellers. Purchase decisions depend on a number of factors, including, but not limited to, hydrology, water demands, availability of other supplies, and transfer costs. Reclamation and DWR may need to reoperate the CVP and SWP to deliver the transferred water, and the reoperation could be limited based on specific hydrologic conditions, biological conditions, or water quality issues. Reclamation cannot guarantee that it will be able to reoperate systems at specific times to accommodate transfers.

**Table 2-4. Potential Buyers**

| <b>Tehama-Colusa Canal Authority Member Units</b> |
|---------------------------------------------------|
| Colusa County Water District                      |
| Corning Water District                            |
| Cortina Water District                            |
| Davis Water District                              |
| Dunnigan Water District                           |
| 4-M Water District                                |
| Glenn Valley Water District                       |
| Glide Water District                              |
| Kanawha Water District                            |
| Orland-Artois Water District                      |
| Westside Water District                           |

### 2.2.3 Potential Water Transfer Methods

This EA/IS analyzes transfers from groundwater substitution and cropland idling/crop shifting, which are further described below. No other types of water transfers are covered by the evaluation in this EA/IS.

Reclamation approves transfers consistent with provisions of state and federal law that protect against injury to third parties as a result of water transfers. Several important principles include requirements that the transfer will not violate the provisions of federal or state law, will have no significant adverse effect on the ability to deliver Project Water, will be limited to water that would be consumptively used or irretrievably lost to beneficial use, and will not adversely affect water supplies for fish and wildlife purposes. Also, CVP contractors must transfer water consistent with their CVP contracts, including clauses that indicate that water used and transfers out of the districts cannot exceed the quantity of water available. Reclamation would not approve water transfers for which these basic principles have not been met.

In 2016, 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 during 2016 for use on lands within the CVP seller's service area. This forbearance would be undertaken in a manner that allows Reclamation to deliver the forborne water supply as Project Water to Member Units of the TCCA. 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.

Additional information about water rights protection and water transfers is located at  
[http://www.waterboards.ca.gov/waterrights/water\\_issues/programs/water\\_transf](http://www.waterboards.ca.gov/waterrights/water_issues/programs/water_transf)

ers/docs/watertransferguide.pdf in a SWRCB staff document titled *A Guide to Water Transfers - Draft* (SWRCB 1999).

#### **2.2.3.1 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 users. Water could be made available for transfer during the irrigation season of April through October.

The conveyance infrastructure used to deliver transferred water to the TCCA would depend on the seller's location. Some sellers, like Glenn-Colusa Irrigation District (ID), have conveyance structures that can deliver water to the TCCA. These conveyance structures are typically used to deliver water to Glenn-Colusa ID from the Tehama-Colusa Canal. During a transfer, these deliveries would be reduced and additional water would stay in the TCCA area. Most of the groundwater substitution transfers are from agencies that typically divert water downstream on the Sacramento River from the Tehama-Colusa Canal. Delivering water to the TCCA instead of downstream users on the Sacramento River could reduce flow in the Sacramento River between the diversion points. Reclamation would work closely with the TCCA to make sure that these transfers do not affect the flow or temperature requirements in the Sacramento River.

An objective in planning a groundwater substitution transfer is to ensure that groundwater levels recover to their seasonal high levels before transfers begin. Because groundwater levels generally recover at the expense of streamflow, the wells used in a groundwater substitution transfer should be sited and pumped in such a manner that the streamflow losses resulting from pumping are primarily during the wet season, when losses to streamflow minimally affect other legal users of water. For the purposes of this EA/IS, the streamflow losses are estimated to be 13 percent of the groundwater pumped to make surface water available for transfer. The quantity of surface water available for transfer would be reduced by these estimated streamflow losses.

#### **2.2.3.2 Cropland Idling/Crop Shifting**

Cropland idling would make water available for transfer that would have been used for agricultural irrigation absent the transfer. Typically, the proceeds from the water transfer would pay growers to idle land that they would have otherwise placed in production. Rice has been the crop idled most frequently in previous transfer programs, and is the crop that could be idled for 2016 transfers.

The quantity of water made available for transfer through cropland idling actions would be calculated based on the evapotranspiration of applied water (ETAW). ETAW is the portion of applied surface water that is evaporated from the soil and plant surfaces and actually used by the crop. For 2016, this EA/IS

only analyzes cropland idling from rice crops, which have an ETAW of 3.3 AF/acre (Reclamation and DWR 2015).

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 ETAW values would be the amount of water that can be transferred. Transfers in 2015 could include water made available by shifting from rice to a crop with a lower water use. Table 2-5 provides a listing of the estimated ETAW values for crops suitable for idling or shifting.

**Table 2-5. Estimated ETAW Values for Crops Suitable for Idling or Shifting**

| Crop                 | ETAW (AF/acre)    |
|----------------------|-------------------|
| Alfalfa <sup>1</sup> | 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: Reclamation and DWR 2015

Notes:

<sup>1</sup> 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.

Water made available through cropland idling or crop shifting actions would be available at the beginning of the season (April or May) and would be available for transfer on the same pattern as would otherwise be used by the crop. Water would be delivered to the TCCA on pattern; that is, in the same volume and at the same time as would have been consumptively used by the crop absent the transfer.

Consistent with the provisions contained in Water Code Section 1018, potential sellers are encouraged to incorporate measures into their crop 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 would generally reduce potential environmental effects associated with cropland idling. The agencies interested in crop shifting are also interested in cropland idling, but are not sure of the distribution between the two methods. To be conservative that the potential impacts are fully addressed, this EA/IS analyzes the effects as if all transfers were from crop idling because crop idling has the greater potential for effects.

## 2.3 Environmental Commitments

This section presents the Environmental Commitments included in the Proposed Action to reduce potential environmental impacts from water transfers in contract year 2016. In 2015, U.S. Fish and Wildlife Service (USFWS) issued a Programmatic Biological Opinion on Long-Term Water Transfers from 2015 to 2024 that includes transfers to TCCA and other users (USFWS 2015a). Under the Programmatic Biological Opinion, the proposed project consists of making up to 565,614 AF of water available for transfer each year through cropland idling/shifting, reservoir releases, groundwater substitution, and conservation. The Programmatic Biological Opinion includes conservation measures that are the same as the Environmental Commitments. For transfer years 2016 to 2024, USFWS requires Reclamation to submit an annual report that describes the proposed action for the calendar year and provides detailed monitoring reports for previous years actions.

- As part of the approval process for 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 GGS are being implemented.
- Reclamation will provide a map(s) to the USFWS in June of each year showing the parcels of rice land that are idled 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 GGS) 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 GGS occurrence. The determination of priority

habitat will be made through coordination with GGS 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 California Department of Fish and Wildlife (CDFW). As appropriate, map updates will be provided to USFWS along with the related GIS data. In addition, 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 GGS 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.
- Areas with known priority GGS 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 water transfers. These areas with known priority GGS populations include lands adjacent to naturalized lands and refuges and corridors between these areas, such as:
  - o 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
  - o Lands in the Natomas Basin.
- Sellers will continue to voluntarily perform GGS best management practices, including educating maintenance personnel to recognize and avoid contact with GGS, cleaning only one side of a conveyance channel per year, and implementing other measures to enhance habitat for GGS.
- 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 in Butte Sink.

- At the end of the 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 EA/IS,
  - 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 the USFWS and shared with CDFW by January 31, 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.

- If, upon review of monitoring reports or other scientific literature, it appears that the proposed project is having unanticipated effects on snakes, Reclamation will initiate contact with the Service to discuss the information available and effectiveness of conservation measures.

## **2.4 Environmental Setting**

The environmental setting in which implementation of the No Action Alternative or Proposed Action would occur is summarized below for resources that could be affected by water transfers. Additional details regarding relevant existing environmental conditions are provided in Chapter 3, within the analysis of potential impacts.

### **2.4.1 Aesthetics**

The Central Valley of California is primarily agricultural in nature, with Interstate 5 running from north to south through the valley floor. Views in the region from most major roadways and scenic routes are of agricultural fields or urban landscapes. The mix of orchard and row crop types, fallow fields, rice, and other irrigated crops and dry fields create the visual character for most of the project area. Urban centers, such as Sacramento and Redding break up the farmland that dominates the views in the Central Valley, creating some major nighttime light sources near the city centers.

### **2.4.2 Air Quality**

Air quality in California is regulated by the U.S. Environmental Protection Agency (USEPA), the California Air Resources Board (CARB), and locally by Air Pollution Control Districts (APCDs) or Air Quality Management Districts

(AQMDs). The following air districts regulate air quality within the project study area:

- Colusa County APCD
- Feather River AQMD
- Glenn County APCD
- Sacramento Metropolitan AQMD
- Shasta County AQMD
- Tehama County APCD
- Yolo/Solano AQMD

In the Sacramento Valley Air Basin, ozone ( $O_3$ ), inhalable particulate matter ( $PM_{10}$ ), and fine particulate matter ( $PM_{2.5}$ ) are pollutants of concern because ambient concentrations of these pollutants exceed the California Ambient Air Quality Standards (CAAQS). Additionally, ambient  $O_3$  and  $PM_{2.5}$  concentrations exceed the National Ambient Air Quality Standards (NAAQS), while  $PM_{10}$  and carbon monoxide (CO) concentrations recently attained the NAAQS and are designated maintenance. Table 2-6 summarizes the attainment status for the counties located in the Sacramento Valley.

The Sacramento Valley Air Basin is bounded by the North Coast Ranges on the west and the Northern Sierra Nevada Mountains on the east, forming a bowl-shaped valley. The Sacramento Valley has a Mediterranean climate, which is characterized by hot dry summers and mild rainy winters.

Most of the sellers' service area supports agricultural land uses. Crop cycles, including land preparation and harvest, contribute to pollutant emissions, primarily particulate matter. Groundwater pumping with diesel and natural gas-fueled engines also emits air pollutants through exhaust. The primary pollutants emitted by diesel pumps are nitrogen oxides ( $NO_x$ ), volatile organic compounds (VOC), CO,  $PM_{10}$ , and  $PM_{2.5}$ ;  $NO_x$  and VOCs are precursors to  $O_3$  formation.

**Table 2-6. State and Federal Attainment Status**

| County     | O <sub>3</sub><br>CAAQS | PM <sub>2.5</sub><br>CAAQS | PM <sub>10</sub><br>CAAQS | O <sub>3</sub><br>NAAQS <sup>1</sup> | PM <sub>2.5</sub><br>NAAQS | PM <sub>10</sub><br>NAAQS | CO<br>NAAQS |
|------------|-------------------------|----------------------------|---------------------------|--------------------------------------|----------------------------|---------------------------|-------------|
| Colusa     | A                       | A                          | N                         | A                                    | A                          | A                         | U           |
| Glenn      | A                       | A                          | N                         | A                                    | A                          | A                         | U           |
| Sacramento | N                       | A                          | N                         | N                                    | N                          | M                         | M           |
| Shasta     | N                       | A                          | N                         | A                                    | A                          | A                         | A           |
| Sutter     | N-T <sup>2</sup>        | A                          | N                         | N <sup>3,4</sup>                     | M                          | A                         | A           |
| Tehama     | N                       | U                          | N                         | A                                    | A                          | A                         | A           |
| Yolo       | N                       | U                          | N                         | N <sup>4</sup>                       | N                          | A                         | M           |

Source: 17 California Code of Regulations §60200-60210; 40 CFR 81; CARB 2013; USEPA 2015a

Notes:

- 1 8-hour O<sub>3</sub> NAAQS was modified in October 2015, but area designations are still pending; the area designations in the table are for the 2008 standard. States have one year after promulgation of a new NAAQS to submit to the USEPA a list of all areas in the state that should be designated as nonattainment. The USEPA subsequently has two years from the date of the standard revision to promulgate the new area designations (42 USC 7407(d)).
- 2 Nonattainment/transitional areas are defined as those areas that during a single calendar year, the State standards were not exceeded more than three times at any monitoring location within the area
- 3 The Sacramento Metro nonattainment area for Sutter County is defined as the “portion south of a line connecting the northern border of Yolo County to the southwestern tip of Yuba County and continuing along the southern Yuba County border to Placer County” (40 CFR 81.305)
- 4 8-hour O<sub>3</sub> classification = severe

Key:

A = attainment (background air quality in the region is less than (has attained) the ambient air quality standards)

CO = carbon monoxide

M = maintenance (area formerly exceeded the ambient air quality standards (i.e., was designated nonattainment), but has since attained the standards)

N = nonattainment (background air quality exceeds the ambient air quality standards)

N-T = nonattainment/transitional (a subcategory of nonattainment where an area is close to attainment, has only two days exceeding standards, and is projected to meet standards within three years)

O<sub>3</sub> = ozone

PM<sub>10</sub> = inhalable particulate matter

PM<sub>2.5</sub> = fine particulate matter

U = unclassified/attainment (area does not have enough monitors to determine the background concentrations; treated the same as attainment)

## 2.4.3 Biological Resources

The project area includes the Sacramento watershed. Natural communities associated with the Sacramento River include valley/foothill riparian and natural seasonal wetland. Valley/foothill riparian natural community generally occurs along river and stream corridors on the east side of the Sacramento Valley. Trees typically associated with the valley/foothill riparian natural community include willows, Fremont cottonwood (*Populus fremontii*), valley oak (*Quercus lobata*), and western sycamore (*Platanus racemosa*). Many species of birds, mammals, reptiles, and amphibians depend on riparian habitats, such as woodpeckers, warblers, flycatchers, owls, and raptors. Other wildlife species that use riparian habitats include western fence lizard (*Sceloporus occidentalis*), Pacific tree frog (*Pseudacris regilla*), western toad (*Anaxyrus boreas*), bullfrog (*Rana catesbeiana*), western skink (*Eumeces skiltonianus*), western whiptail (*Cnemidophorus tigris*), southern alligator lizard (*Elgaria multicarinata*), racer (*Coluber constrictor*), gopher snake (*Pituophis catenifer*),

king snake (*Lampropeltis* sp.), garter snake (*Thamnophis* sp.), northern Pacific rattlesnake (*Crotalus oreganus oreganus*), opossum (*Didelphis virginiana*), black-tailed jackrabbit (*Lepus californicus*), western gray squirrel (*Sciurus griseus*), ringtail (*Bassariscus astutus*), river otter (*Lontra canadensis*), striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), beaver (*Castor canadensis*), mule deer (*Odocoileus hemionus*), and a number of bat species. Wetland natural communities support many species of waterfowl, such as mallard (*Anas platyrhynchos*), northern pintail (*Anas acuta*), American widgeon (*Anas americana*), and Canada goose (*Branta canadensis*), and a variety of wading birds and shorebirds.

In the Sacramento Valley, seasonally flooded agriculture, in particular rice fields, provide important foraging habitat for a variety of wildlife species. There are approximately 500,000 acres of rice fields in the Sacramento Valley which, along with natural wetlands, support millions of waterfowl along the Pacific Flyway (California Rice Commission 2011). Flooded agriculture within the Sacramento Valley accounts for approximately 57 percent of food resources available to waterfowl (Petrie and Petrick 2010). Rice fields also provide foraging, resting, breeding, and wintering habitat for shorebirds and wading birds, and foraging habitat for raptors. These habitats are also important for foraging, refuge, and dispersal for reptiles, amphibians, and mammals.

Special-status wildlife species with potential to occur in the project area are listed in Appendix A. As described in the appendix, five species have potential to be affected by rice idling and are further evaluated in Chapter 3. This includes the following species: GGS (*Thamnophis gigas*), greater sandhill crane (*Grus canadensis tabida*), black tern (*Chlidonias niger*), tricolored blackbird (*Agelaius tricolor*), and pacific pond turtle (*Actinemys marmorata*). The following listings apply to the above species under the Federal and California Endangered Species Acts (ESA).

- GGS – listed as threatened under the Federal and California ESAs (DFW 2015a)
- Greater Sandhill Crane – listed as threatened under the California ESA and is fully protected under the California Fish and Game Code (DFW 2015a; DFW 2015b)
- Black Tern – listed as a State Species of Concern (DFW 2015c)
- Pacific Pond Turtle – status is under review under the Federal ESA and considered a State Species of Concern by DFW (DFW 2015c)
- Tricolored Blackbird – considered a State Species of Concern by DFW. On December 3, 2014, the California Fish and Game Commission granted emergency protections to the Tricolored blackbird. The action granted a 180-day period for DFW to determine whether to make the

protections permanent. In June 2015, the Commission determined not to advance a petition to list the species under the California ESA. In September 2015, USFWS announced that the Tricolored Blackbird is one of several species that it will formally consider for protection under the ESA.

In addition to these special-status species, migratory birds are protected under the Migratory Bird Treaty Act.

Special-status plant species with potential to occur are listed in Appendix B. Based on the analysis presented in the appendix, no special-status plants would be affected by the project.

Table 2-7 summarizes fish species of concern in the project area.

**Table 2-7. Fish Species of Management Concern in the Project Area**

| Status         | Species                                                            | Primary Management Consideration |
|----------------|--------------------------------------------------------------------|----------------------------------|
| Special-Status | Chinook Salmon<br>( <i>Oncorhynchus tshawytscha</i> ) – Winter run | FE, SE                           |
|                | Chinook Salmon – Spring-run                                        | FT, ST                           |
|                | Central Valley Steelhead<br>( <i>Oncorhynchus mykiss</i> )         | FT, Recreation                   |
|                | Green sturgeon ( <i>Acipenser medirostris</i> )                    | FT                               |
|                | Hardhead ( <i>Mylopharodon conocephalus</i> )                      | SSC                              |
|                | Sacramento splittail<br>( <i>Pogonichthys macrolepidotus</i> )     | SSC                              |
|                | Chinook Salmon – Fall/late-fall run                                | SSC, Commercial, Recreation      |
| Other          | Striped bass ( <i>Morone saxatilis</i> )                           | Recreation                       |
|                | American shad ( <i>Alosa sapidissima</i> )                         | Recreation                       |
|                | White sturgeon ( <i>Acipenser transmontanus</i> )                  | Commercial, Recreation           |

Source: USFWS 2015b; DFW 2015b; DFW 2015c

Key:

FE = Federal endangered

FT = Federal threatened

SE = State endangered

ST = State threatened

SSC = State Species of Special Concern

Recreation = non-listed commercially important species of management concern.

Commercial = non-listed recreationally important species of management concern.

The current drought has resulted in a reduction of the cold water pool in Shasta Reservoir. The drought has also resulted in elevated temperatures in the upper reaches of the Sacramento River, which contributed to low survival rates for wild juvenile winter-run Chinook salmon in 2014 and 2015 (SWRCB 2015).

The Sacramento River Temperature Management Plan, which is required annually, guides the release of water from Shasta Reservoir to maintain healthy fisheries during summer and fall when temperatures rise. In 2015, Reclamation, in coordination with National Marine Fisheries Service (NMFS), the USFWS, DWR, DFW, and the SWRCB, modified the previous Shasta Temperature Management Plan in an attempt to better utilize the current cold-water resource and manage the seasonal temperature risks to winter-run Chinook salmon. Reclamation, DWR, the fishery resource agencies, and SWRCB are currently preparing a management plan for the Sacramento River for 2016 to ensure the protection of winter-run Chinook salmon and other salmonids. The plan is required to be submitted to the SWRCB for review by March 15, 2016.

#### **2.4.4 Geology and Soils**

The Central Valley consists of mostly flat terrain associated with low gradient river valleys. There are some earthquake faults in the region, but earthquakes are generally associated with coastal California, west of the Central Valley. Strong seismic shaking is not common in the Central Valley, and liquefaction and other seismic-related ground failure are not major hazards in the region. Landslides and other hazards associated with unstable soil are uncommon due to the flat terrain. Dust from agricultural activities, such as plowing, grading, and discing, is a common occurrence in the Central Valley agricultural area, including the project area, and is a normal part of the agriculture practice in the region.

#### **2.4.5 Greenhouse Gas Emissions**

The greenhouse gas (GHG) analysis focuses on the following three pollutants: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O). The other two pollutant groups commonly evaluated in various GHG reporting protocols, hydrofluorocarbons and perfluorocarbons, are not expected to be emitted in large quantities as a result of the alternatives and are not discussed further in this section.

California is the second highest emitter of GHG emissions in the United States, only behind Texas; however, from a per capita standpoint, California has the 45<sup>th</sup> lowest GHG emissions among the states. Worldwide, California is the 20<sup>th</sup> largest emitter of CO<sub>2</sub> if it were a country; on a per capita basis, California would be ranked 38<sup>th</sup> in the world (CARB 2014). Agricultural emissions represented approximately eight percent of California's GHG emissions in 2012. Agricultural emissions represent the sum of emissions from agricultural energy use (from pumping and farm equipment), agricultural residue burning, agricultural soil management (the practice of using fertilizers, soil amendments, and irrigation to optimize crop yield), enteric fermentation (fermentation that takes place in the digestive system of animals), histosols (soils that are

composed mainly of organic matter) cultivation, manure management, and rice cultivation.

## **2.4.6 Hydrology and Water Quality**

### **2.4.6.1 Surface Water**

The Sacramento River flows south for 447 miles through the northern Central Valley and enters the Delta from the north. The major tributaries to the Sacramento River are the Feather, Yuba, and American rivers. Reclamation owns and operates the CVP, which has major reservoirs on the Sacramento River (Shasta Reservoir) and American River (Folsom Reservoir). DWR owns and operates the SWP, which has a major reservoir on the Feather River (Oroville Reservoir).

### **2.4.6.2 Surface Water Quality**

While surface water quality in the Sacramento River system is generally good, several water bodies within the area of analysis have been identified as impaired by certain constituents of concern and appear on the most recent 303(d) list of impaired waterways under the Clean Water Act (SWRCB 2011).

### **2.4.6.3 Groundwater**

#### **Redding Groundwater Basin**

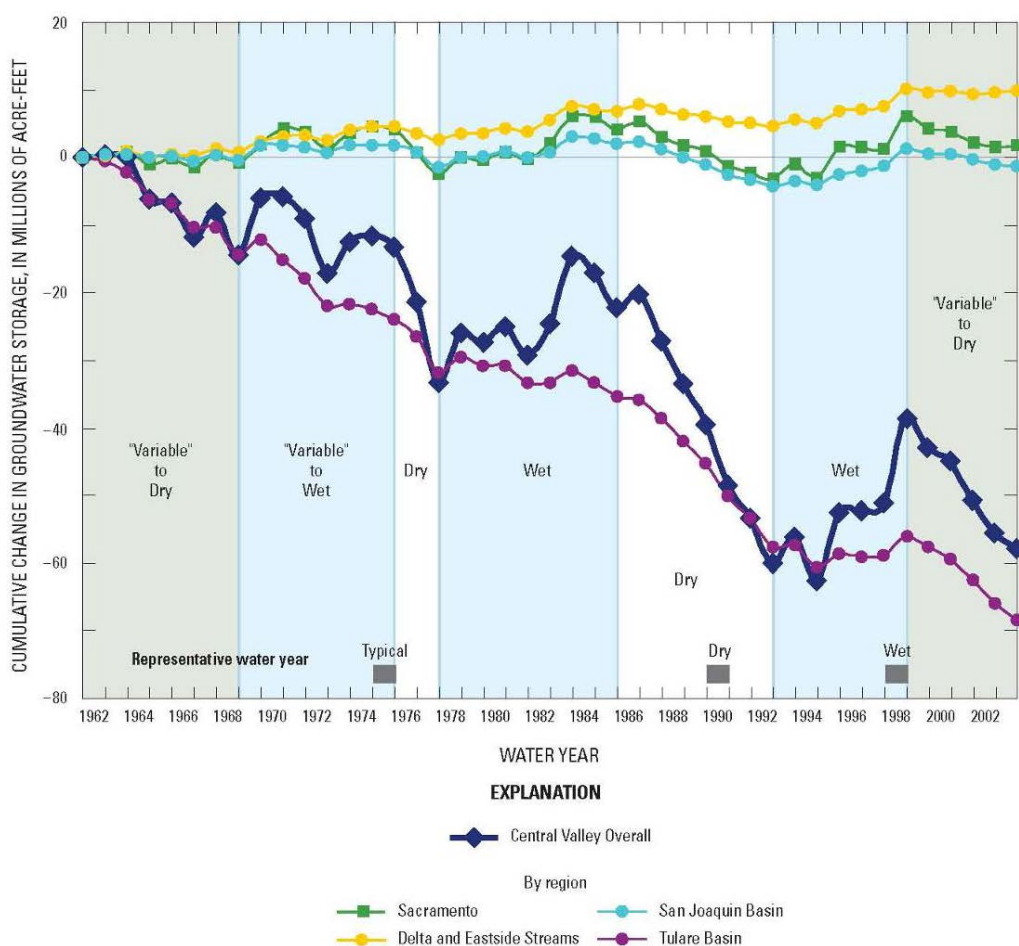
Historically, groundwater levels have remained stable within the Redding Groundwater Basin. Seasonal fluctuations in groundwater levels are generally less than five feet and can be up to 16 feet during drought years (Anderson-Cottonwood ID 2011). These declines are usually followed by recovery to pre-drought levels after several successive normal or above-normal precipitation events have occurred (CH2M HILL 2007). Appendix C includes groundwater monitoring data in the Anderson-Cottonwood ID area (the potential selling entity in the Redding Basin).

*Land Subsidence.* Land subsidence has not been monitored in the Redding Area Groundwater Basin. However, there would be potential for subsidence in some areas of the basin if groundwater levels were substantially lowered. The groundwater basin west of the Sacramento River is composed of the Tehama Formation, which has exhibited subsidence in Yolo County.

*Groundwater Quality.* Groundwater in the Redding Groundwater Basin area of analysis is typically of good quality, as evidenced by its low total dissolved solids (TDS) concentrations, which range from 70 to 360 milligrams per liter (mg/L). Areas of high salinity (poor water quality), are generally found on the western basin margins, where the groundwater is derived from marine sedimentary rock. Elevated levels of iron, manganese, nitrate, and high TDS have been detected in some areas (DWR 2003).

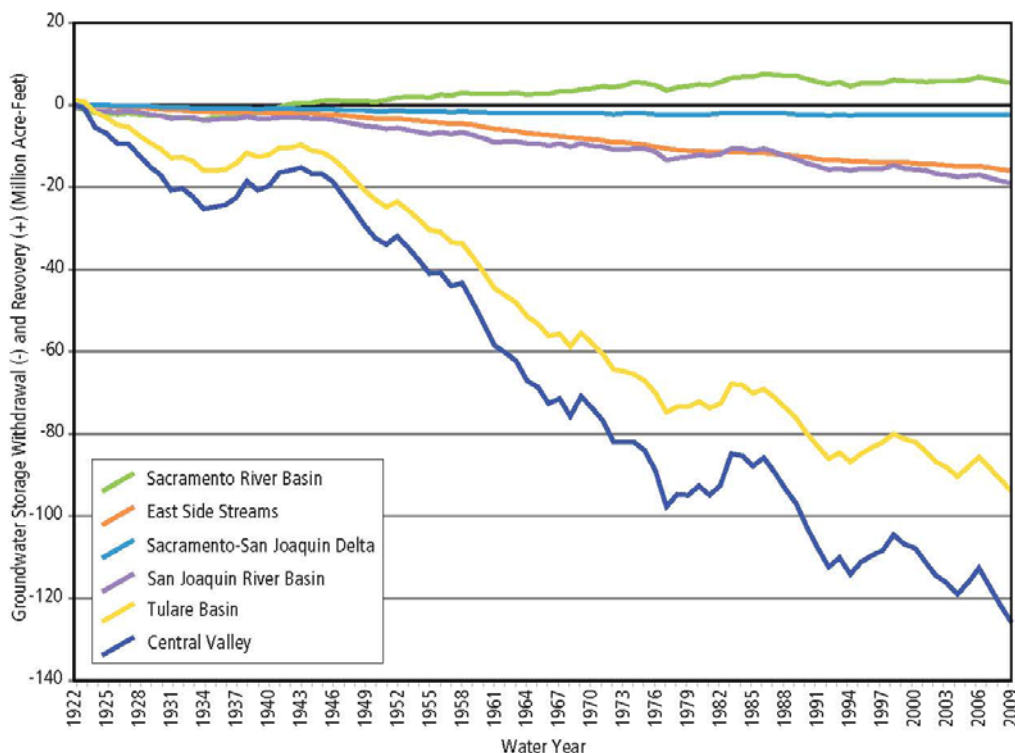
### Sacramento Valley Groundwater Basin

The Sacramento Valley Groundwater Basin includes portions of Tehama, Glenn, Butte, Yuba, Colusa, Placer, and Yolo Counties. Under normal hydrologic conditions, groundwater accounts for less than 30 percent of the annual supply used for agricultural and urban purposes within the Sacramento Valley. Urban pumping in the Sacramento Valley increased from approximately 250,000 AF annually in 1961 to more than 800,000 AF annually in 2003 (Faunt 2009). As shown in Figures 2-2 and 2-3, respectively, the U.S. Geological Survey's (USGS's) Central Valley Hydrologic Model (CVHM) and DWR's Central Valley Groundwater-Surface Water Simulation Model (C2VSim) show groundwater storage in the Sacramento Valley Groundwater Basin has been relatively constant over the long term. Storage tends to decrease during dry years and increase during wetter periods.



Source: Faunt 2009

**Figure 2-2. Cumulative Annual Change in Storage as Simulated by the USGS's Central Valley Hydrologic Model**



Source: Brush et al 2013

**Figure 2-3. Cumulative Annual Change in Storage as simulated by DWR's California Central Valley Groundwater-Surface Water Simulation Model**

Groundwater levels in the northern Sacramento Valley Groundwater Basin have declined considerably over the last decade (spring 2004 to spring 2014). On average, in the shallow, intermediate, and deep aquifer zones, groundwater elevations have declined 12.5 feet (see Plates 1S-B, 1I-B, and 1D-b in Appendix C). These decreases in groundwater levels have caused wells to go dry in parts of the valley. Table 2-8 below summarizes the number of wells reported dry in 2014 and 2015. Persistent dry weather conditions since 2006 have been partially responsible for these steep declining trends. Water Year (WY) 2011 has been the only year since 2006 classified as a wet year. Though the Sacramento Valley Groundwater Basin and other parts of California are currently noticing declining groundwater level trends, past groundwater trends are indicative of groundwater levels declining moderately during extended droughts and recovering to pre-drought levels after subsequent wet periods. For example, changes in groundwater elevations in the Sacramento Valley Groundwater Basin between spring 2010 and spring 2011 (DWR 2015a) indicates an overall increasing trend up to eight feet in the shallow aquifer (less 200 feet below ground surface [bgs]). Recovery in the intermediate aquifer (between 200 to 600 feet bgs) was approximately +7.5 feet. Recovery in the deep aquifer (greater than 600 feet bgs) was lower (up to +4.5 feet). Increases in groundwater levels in 2011 occurred after four consecutive years of dry or

critically dry conditions in the Sacramento Valley Groundwater Basin (WY 2007 to WY 2010). Appendix C includes groundwater monitoring data to further characterize groundwater levels in the Sacramento Valley Groundwater Basin near the potential selling entities.

**Table 2-8. Summary of Dry Wells Reported in 2014 and 2015**

| Counties   | Number of wells reported dry in 2014 and 2015 | Information received as of: |
|------------|-----------------------------------------------|-----------------------------|
| Shasta     | 3                                             | 9/16/2014                   |
| Tehama     | 34                                            | 7/22/2015                   |
| Glenn      | 28                                            | 8/28/2015                   |
| Butte      | 70                                            | 7/28/2015                   |
| Colusa     | 8                                             | 7/7/2014                    |
| Sutter     | Data not available                            | Data not available          |
| Yuba       | Data not available                            | Data not available          |
| Solano     | 2                                             | 10/22/2015                  |
| Yolo       | 5                                             | 8/11/2015                   |
| Sacramento | 1                                             | 10/16/2014                  |

Source: Data collected by University of California Davis

\*Number of dry wells reported are cumulative starting January 2014

*Land Subsidence.* Historically, land subsidence occurred in the eastern portion of Yolo County and the southern portion of Colusa County, owing to groundwater extraction and geology. Due to groundwater withdrawal over several decades, as much as four feet of land subsidence has occurred east of the town of Zamora. In Yolo County within Conaway Ranch, DWR observed land subsidence estimated at approximately 0.2 foot from 2012 to 2013 and an additional 0.6 foot from 2013 to 2014 (DWR 2014a). In comparison, slightly less than 0.1 foot of subsidence occurred over the previous 22 years (1991-2012). The area between Zamora, Knights Landing, and Woodland has been most affected (Yolo County 2012). Subsidence in this region is generally related to groundwater pumping and subsequent consolidation of loose aquifer sediments.

*Groundwater Quality.* Groundwater quality in the Sacramento Valley Groundwater Basin is generally good and sufficient for municipal, agricultural, domestic, and industrial uses. However, there are some localized groundwater quality issues in the basin. Some of the water quality issues within the Sacramento Valley may include occurrences of saltwater intrusion or elevated levels of nitrates, naturally occurring boron, and other introduced chemicals (DWR 2003).

## 2.4.7 Noise

Noise is generally measured in decibels (dB), which are measured on a logarithmic scale so that each increase in 10 dB equals a doubling of loudness. The letter “A” is added to the abbreviation (dBA) to indicate an “A-weighted” scale, which filters out very low and very high frequencies that cannot be heard by the human ear.

The buyers and sellers areas are primarily agricultural; major noise sources include traffic, railroad operations, airports, industrial operations, farming operations, and fixed noise sources. Common noise sources associated with farming operations include tractors, harvesting equipment and spray equipment (Glenn County 1993). Typical noise levels created by a range of farm equipment are presented in Table 2-9.

**Table 2-9. Typical Noise Levels Associated with Farm Equipment**

| Equipment                  | Distance (feet) | Sound Level (dB) |
|----------------------------|-----------------|------------------|
| Diesel Wheel Tractor       |                 |                  |
| - with Disc                | 150             | 72-75            |
| - with Furrow              | 50              | 69-79            |
| Weed Sprayer (1-cylinder)  | 50              | 74-75            |
| Aero Fan 391 Speed Sprayer | 200             | 74-76            |
| Diesel Engine              | 50              | 75-85            |

Source: Brown-Buntin Associates, Inc. in Glenn County 1993

Key: dB = decibel

A Community Noise Survey conducted in Glenn County indicated that typical noise levels in noise sensitive areas, including rural areas, are relatively quiet and fall in the range of 48 dB to 60 dB Ldn<sup>2</sup> (Glenn County 1993). These noise levels would be reflective of conditions in the other counties.

---

<sup>2</sup> The day-night average sound level (Ldn) is the average noise level, expressed in decibels, over a 24-hour period.

## Chapter 3 Environmental Impacts

The following sections use the checklist from Appendix G of the CEQA Guidelines as a template to assess potential environmental effects under both CEQA and NEPA. The discussion for each resource focuses on potential impacts; resources that would not be affected are briefly discussed.

### I. AESTHETICS

-- Would the project:

|                                                                                                                                                                                                                                     | Potentially<br>Significant<br>Impact | Less Than<br>Significant with<br>Mitigation<br>Incorporation | Less Than<br>Significant<br>Impact  | No<br>Impact                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------------------------------|-------------------------------------|-------------------------------------|
| a) Have a substantial adverse effect on a scenic vista?                                                                                                                                                                             | <input type="checkbox"/>             | <input type="checkbox"/>                                     | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings, or other locally recognized desirable aesthetic natural feature within a city-designated scenic highway? | <input type="checkbox"/>             | <input type="checkbox"/>                                     | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| c) Substantially degrade the existing visual character or quality of the site and its surroundings?                                                                                                                                 | <input type="checkbox"/>             | <input type="checkbox"/>                                     | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?                                                                                                               | <input type="checkbox"/>             | <input type="checkbox"/>                                     | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

**a, b, d) No Impact.** The No Action Alternative and Proposed Action would not affect any scenic vista, damage scenic resources, or create a new light source. The Proposed Action would not affect scenic vistas relative to rivers or reservoirs because there would be no changes beyond historical or seasonal fluctuations in flows or water levels. The Proposed Action does not result in any construction or new structures that could damage scenic resources (i.e., trees, rock outcroppings, historic buildings, etc.) or produce notable sources of light or glare.

**c) Less than Significant.** The No Action Alternative may increase cropland idling in response to water shortages associated with the dry hydrologic conditions. Cropland idling transfers under the Proposed Action would temporarily increase the amount of idled lands in the sellers' area. Idled lands are typical features of agricultural landscapes as part of normal cultivation practices. The crop pattern resulting from the Proposed Action would likely be indistinguishable from those under normal cropping patterns. This impact would be less than significant as there would be no substantial changes or degradation to the visual character and quality of the sites or their surroundings.

## II. AGRICULTURE AND FOREST RESOURCES:

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:

|                                                                                                                                                                                                                                                | Potentially<br>Significant<br>Impact | Less Than<br>Significant<br>with<br>Mitigation<br>Incorporation | Less Than<br>Significant<br>Impact | No<br>Impact                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------|------------------------------------|-------------------------------------|
| a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?                                                                                                                                                           | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |

|                                                                                                                                                                                                                                                                                            | Potentially<br>Significant<br>Impact | Less Than<br>Significant<br>with<br>Mitigation<br>Incorporation | Less Than<br>Significant<br>Impact | No<br>Impact                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------|------------------------------------|-------------------------------------|
| c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))? | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| d) Result in the loss of forest land or conversion of forest land to non-forest use?                                                                                                                                                                                                       | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?                                                                               | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |

**a, b, e) No Impact.** The No Action Alternative could result in increased cropland idling in 2016 in response to reduced surface water supplies from the CVP and SWP. One-year water transfers under the Proposed Action temporarily take land out of production, but would not affect the long-term agricultural uses of the land. Idling cropland for a single year would be similar to fallowing a field under a normal crop rotation and would not convert any land to a non-agricultural use. Cropland idling would not affect the long-term designations of Prime Farmland or other Farmland Mapping and Monitoring Program classifications or affect Williamson Act contracts.

**c, d) No Impact.** The No Action Alternative and Proposed Action would have no impact to existing forest lands or timber, as the proposed water transfer methods do not pertain to such lands or resources.

### III. AIR QUALITY

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

|                                                                                                                                                                                                                                                                                             | Potentially<br>Significant<br>Impact | Less Than<br>Significant<br>with<br>Mitigation<br>Incorporation | Less Than<br>Significant<br>Impact  | No<br>Impact                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------|-------------------------------------|-------------------------------------|
| a) Conflict with or obstruct implementation of the applicable air quality plan?                                                                                                                                                                                                             | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?                                                                                                                                                                          | <input type="checkbox"/>             | <input checked="" type="checkbox"/>                             | <input type="checkbox"/>            | <input type="checkbox"/>            |
| c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)? | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| d) Expose sensitive receptors to substantial pollutant concentrations?                                                                                                                                                                                                                      | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| e) Create objectionable odors affecting a substantial number of people?                                                                                                                                                                                                                     | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

#### a) Less than Significant Impact

**No Action Alternative:** Under the No Action Alternative, growers may idle rice or pump groundwater to supplement reduced surface water supplies. Crop idling actions could increase fugitive dust emissions. Although there could be emission increases under the No Action Alternative, the emissions would be consistent with existing trends in air quality and would be the same as existing conditions; therefore, emissions could not impede implementation of any air quality plan.

**Proposed Action:** The air districts associated with the counties of Shasta, Tehama, Glenn, Butte, Colusa, Sutter, and Yuba comprise the Northern Sacramento Valley Planning Area (NSVPA). The NSVPA has jointly committed to preparing and adopting an Air Quality Attainment Plan (AQAP) to achieve and maintain healthful air in these counties. The Sacramento Metropolitan AQMD and the Yolo/Solano AQMD have also adopted various air

quality plans for the pollutants for which they are currently designated nonattainment. As part of these plans, several control measures were adopted by the various counties to attain and maintain air quality standards. These control measures are then promulgated in the rules and regulations at each air district; therefore, if a Proposed Action is consistent with the air districts' and State regulations, then the project is in compliance with the AQAP. The air quality impacts from water transfer actions are associated with the actions taken to reduce consumptive use.

The Proposed Action would use a combination of electric, diesel, and propane driven groundwater pumps depending on the specific water agency. All diesel-fueled engines are subject to CARB's Airborne Toxic Control Measure (ATCM) for Stationary Ignition Engines (17 California Code of Regulations [CCR] 93115). The ATCM does not expressly prohibit the use of diesel engines for agricultural purposes; therefore, diesel engines may be used for groundwater pumping associated with groundwater substitution transfers as long as they are replaced when required by the compliance schedule.

All pumps proposed to be used by the water agencies would operate in compliance with all rules and regulations at the federal, state, and local levels; therefore, any activities associated with water transfers would be consistent with the AQAPs and the ATCM. As such, impacts would be less than significant.

#### **b) Less than Significant**

**No Action Alternative:** Under the No Action Alternative, growers would leave some crops idle, which would leave bare soils susceptible to fugitive dust emissions from windblown dusts. Growers would also continue to pump groundwater for irrigation, which releases emissions if diesel pumps are used. These actions in response to surface water shortages would continue under the No Action Alternative. There would be no change to emissions relative to existing conditions.

**Proposed Action:** To assess whether a proposed project would violate any air quality standards or contribute substantially to an existing or projected air quality violation, several of the air districts developed significance thresholds for mass daily and/or annual emission rates of criteria pollutants. Colusa, Glenn, and Shasta counties do not have published significance thresholds; therefore, the threshold used to define a "major source" in the Clean Air Act (100 tons per year) was used to evaluate significance. Table 3-1 summarizes the significance thresholds used by each air district.

**Table 3-1. CEQA Operational Significance Thresholds**

| Air District                 | VOC        | NOx        | CO | SOx | PM <sub>10</sub> | PM <sub>2.5</sub> |
|------------------------------|------------|------------|----|-----|------------------|-------------------|
| Sacramento Metropolitan AQMD | 65 lbs/day | 65 lbs/day | -- | --  | --               | --                |
| Yolo-Solano AQMD             | 10 tpy     | 10 tpy     | -- | --  | 80 lbs/day       | --                |
| Feather River AQMD           | 25 lbs/day | 25 lbs/day | -- | --  | 80 lbs/day       | --                |

Source: Feather River AQMD 2010; Sacramento Metropolitan AQMD 2014a; Yolo-Solano AQMD 2007.

Key:

-- = no threshold; AQMD = air quality management district; CO = carbon monoxide; lbs/day = pounds per day; NOx = nitrogen oxides; PM<sub>10</sub> = inhalable particulate matter; PM<sub>2.5</sub> = fine particulate matter; SOx = sulfur oxides; tpy = tons per year; VOC = volatile organic compounds

In addition to the CEQA significance thresholds, the federal general conformity regulations apply to a proposed federal action in a nonattainment or maintenance area if the total of direct and indirect emissions of the relevant criteria pollutants and precursor pollutants caused by the proposed action equal or exceed certain de minimis amounts (40 CFR 93.153). Conformity means that such federal actions must be consistent with a state implementation plan's (SIP's) purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of those standards.

Groundwater substitution could increase air emissions in the seller area. Cropland idling transfers could reduce vehicle exhaust emissions, but increase fugitive dust emissions. Cropland idling transfers could offset some of the emissions from groundwater substitution transfers, but cropland idling transfers may not occur up to the upper limits and therefore cannot be counted on to reduce impacts of groundwater substitution. This section only analyzes impacts from groundwater substitution to estimate the maximum potential emissions that could occur under the Proposed Action.

Some of the groundwater substitution transfers could go to users who would have pumped groundwater in response to surface water shortages in the No Action Alternative. The emissions from the reduction compared to the No Action Alternative could offset some of the emissions in the Proposed Action, but the quantity of the offset is uncertain. Therefore, this offset is also not considered within the analysis.

Table 3-2 summarizes the maximum daily emissions that would be estimated to occur in each water agency subject to a daily significance threshold. Table 3-3 summarizes the annual emissions that would occur in each water agency subject to an annual significance threshold. Significance was determined for individual water agencies.

**Table 3-2. Unmitigated Peak Daily Emissions (lbs/day)**

| Water Agency                                      | VOC      | NOx      | CO       | SOx      | PM <sub>10</sub> | PM <sub>2.5</sub> |
|---------------------------------------------------|----------|----------|----------|----------|------------------|-------------------|
| <b>Feather River AQMD</b>                         |          |          |          |          |                  |                   |
| Burroughs Farms                                   | electric | electric | electric | electric | electric         | electric          |
| Guisti Farms                                      | 3        | 6        | 12       | <1       | <1               | <1                |
| Natomas Central Mutual Water Company <sup>1</sup> | <1       | 12       | 3        | 3        | <1               | <1                |
| Pelger Mutual Water Company                       | 1        | 19       | 25       | 6        | 1                | 1                 |
| Pelger Road 1700 LLC                              | electric | electric | electric | electric | electric         | electric          |
| Pleasant Grove-Verona Mutual Water Company        | 30       | 271      | 137      | 35       | 8                | 8                 |
| Reclamation District 1004 <sup>2</sup>            | No Eng.  | No Eng.  | No Eng.  | No Eng.  | No Eng.          | No Eng.           |
| Sutter Mutual Water Company                       | No GW    | No GW    | No GW    | No GW    | No GW            | No GW             |
| CEQA Significance Threshold                       | 25       | 25       | n/a      | n/a      | 80               | n/a               |
| <b>Sacramento Metropolitan AQMD</b>               |          |          |          |          |                  |                   |
| Natomas Central Mutual Water Company <sup>1</sup> | <1       | 31       | 1        | 15       | <1               | <1                |
| CEQA Significance Threshold                       | 65       | 65       | n/a      | n/a      | n/a              | n/a               |
| <b>Yolo/Solano AQMD</b>                           |          |          |          |          |                  |                   |
| Conaway Preservation Group <sup>3</sup>           | No GW    | No GW    | No GW    | No GW    | No GW            | No GW             |
| Reclamation District 108 <sup>4</sup>             | electric | electric | electric | electric | electric         | electric          |
| River Garden Farms <sup>3</sup>                   | electric | electric | electric | electric | electric         | electric          |
| Te Velde Revocable Family Trust <sup>3</sup>      | electric | electric | electric | electric | electric         | electric          |
| CEQA Significance Threshold                       | n/a      | n/a      | n/a      | n/a      | 80               | n/a               |

Notes:

<sup>1</sup> Natomas Central Mutual Water Company is split into two different air districts; therefore, only emissions for Sutter County and Sacramento County are included in the summaries for Feather River AQMD and Sacramento Metropolitan AQMD, respectively.

<sup>2</sup> Reclamation District 1004 is split into three different air districts; therefore, only emissions from Sutter County are included.

<sup>3</sup> Conaway Preservation Group, River Garden Farms, and Te Velde Revocable Family Trust are split into two different air districts; therefore, only emissions from Yolo County are included.

<sup>4</sup> Reclamation District 108 is split into three different air districts; therefore, only emissions from Yolo County are included.

Key:

AQMD = air quality management district; CEQA = California Environmental Quality Act; CO = carbon monoxide; electric = all electric engines; lbs/day = pounds per day; n/a = not applicable; No Eng. = no engines operating in county; No GW = no groundwater substitution; NOx = nitrogen oxides; PM<sub>10</sub> = inhalable particulate matter; PM<sub>2.5</sub> = fine particulate matter; SOx = sulfur oxides; VOC = volatile organic compound

**Table 3-3. Unmitigated Annual Emissions (tons per year)**

| Water Agency                                            | VOC      | NOx      | CO       | SOx      | PM <sub>10</sub> | PM <sub>2.5</sub> |
|---------------------------------------------------------|----------|----------|----------|----------|------------------|-------------------|
| <b>Colusa County APCD</b>                               |          |          |          |          |                  |                   |
| Canal Farms                                             | <1       | <1       | <1       | <1       | <1               | <1                |
| Eastside Mutual Water Company                           | 3        | 2        | 3        | 1        | <1               | <1                |
| Glenn-Colusa Irrigation District <sup>1</sup>           | 1        | 14       | 3        | 1        | <1               | <1                |
| Lewis Ranch                                             | No GW    | No GW    | No GW    | No GW    | No GW            | No GW             |
| Maxwell Irrigation District                             | <1       | 3        | 3        | 1        | <1               | <1                |
| Princeton-Codora-Glenn Irrigation District <sup>1</sup> | No Eng.  | No Eng.  | No Eng.  | No Eng.  | No Eng.          | No Eng.           |
| Provident Irrigation District <sup>1</sup>              | No Eng.  | No Eng.  | No Eng.  | No Eng.  | No Eng.          | No Eng.           |
| Reclamation District 108 <sup>2</sup>                   | electric | electric | electric | electric | electric         | electric          |
| Reclamation District 1004 <sup>2</sup>                  | 1        | 18       | 5        | 2        | <1               | <1                |
| Sycamore Mutual Water Company                           | electric | electric | electric | electric | electric         | electric          |
| T&P Farms                                               | electric | electric | electric | electric | electric         | electric          |
| CEQA Significance Threshold                             | 100      | 100      | 100      | 100      | 100              | 100               |

| Water Agency                                            | VOC      | NOx      | CO       | SOx      | PM <sub>10</sub> | PM <sub>2.5</sub> |
|---------------------------------------------------------|----------|----------|----------|----------|------------------|-------------------|
| Glenn County APCD                                       |          |          |          |          |                  |                   |
| Glenn-Colusa Irrigation District <sup>3</sup>           | <1       | 3        | 1        | <1       | <1               | <1                |
| Princeton-Codora-Glenn Irrigation District <sup>3</sup> | 2        | 27       | 8        | 2        | <1               | <1                |
| Provident Irrigation District <sup>3</sup>              | 6        | 68       | 21       | 6        | 1                | 1                 |
| Reclamation District 1004 <sup>4</sup>                  | <1       | 1        | <1       | <1       | <1               | <1                |
| CEQA Significance Threshold                             | 100      | 100      | 100      | 100      | 100              | 100               |
| Shasta County AQMD                                      |          |          |          |          |                  |                   |
| Anderson-Cottonwood Irrigation District                 | electric | electric | electric | electric | electric         | electric          |
| CEQA Significance Threshold                             | 100      | 100      | 100      | 100      | 100              | 100               |
| Yolo/Solano AQMD                                        |          |          |          |          |                  |                   |
| Conaway Preservation Group <sup>5</sup>                 | No GW    | No GW    | No GW    | No GW    | No GW            | No GW             |
| Reclamation District 108 <sup>6</sup>                   | electric | electric | electric | electric | electric         | electric          |
| River Garden Farms <sup>5</sup>                         | electric | electric | electric | electric | electric         | electric          |
| Te Velde Revocable Family Trust <sup>5</sup>            | electric | electric | electric | electric | electric         | electric          |
| CEQA Significance Threshold                             | 10       | 10       | n/a      | n/a      | n/a              | n/a               |

Notes:

- <sup>1</sup> Glenn-Colusa Irrigation District, Princeton-Codora-Glenn Irrigation District, and Provident Irrigation District are split into two different air districts; therefore, only emissions from Colusa County included.
- <sup>2</sup> Reclamation District 108 and Reclamation District 1004 are split into two different air districts; therefore, only emissions from Colusa County included.
- <sup>3</sup> Glenn-Colusa Irrigation District, Princeton-Codora-Glenn Irrigation District, and Provident Irrigation District are split into two different air districts; therefore, only emissions from Glenn County included.
- <sup>4</sup> Reclamation District 1004 split into three different air basins; therefore, only emissions from Glenn County included.
- <sup>5</sup> Conaway Preservation Group, River Garden Farms, and Te Velde Revocable Family Trust are split into two different air districts; therefore, only emissions from Yolo County are included.
- <sup>6</sup> Reclamation District 108 is split into three different air districts; therefore, only emissions from Yolo County are included.

Key:

APCD = air pollution control district; AQMD = air quality management district; CEQA = California Environmental Quality Act; CO = carbon monoxide; electric = all electric engines; n/a = not applicable; No Eng. = No Eng. = no engines operating in county; NOx = nitrogen oxides; PM<sub>10</sub> = inhalable particulate matter; PM<sub>2.5</sub> = fine particulate matter; SOx = sulfur oxides; VOC = volatile organic compound

As shown in the tables, Pleasant Grove-Verona Mutual Water Company would exceed the daily VOC and NOx thresholds (Table 3-2). The following mitigation measure would reduce the severity of the air quality impacts:

- AQ-1 – Selling agency would reduce pumping at diesel wells to reduce emissions to below the thresholds. If an agency is transferring water through cropland idling and groundwater substitution in the same year, the reduction in vehicle emissions can partially offset groundwater substitution pumping at a rate of 4.25 AF of water produced by idling to one acre-foot of groundwater pumped. Agencies may also decide to replace old diesel wells to reduce emission below the thresholds.

If a selling agency, through the actions above, can reduce daily emissions below thresholds while operating wells 24 hours per day, then that agency must provide an analysis to Reclamation. This analysis should identify that all wells proposed for participation in a 2016 Water Transfer may be operated on a 24-hour per day basis without exceeding emission thresholds.

Alternately, if a selling agency with potentially significant emissions, as determined by this EA/IS, intends to operate wells less than 24 hours per day to reduce emissions below the thresholds, then that agency will be required to maintain recordkeeping logs that document the specific engine to be used for groundwater substitution transfers, the power rating (hp), and applicable emission factors. Emission calculations for daily emissions will be completed for comparison to the significance thresholds determined for each selling agency. The recordkeeping logs will be sent to Reclamation monthly for verification that emissions are within the allowable limits.

Reclamation will also work with the water agencies to inform individual growers of incentive funding available through the Natural Resources Conservation Service's Environmental Quality Incentives Program. Funded conservation practices include the replacement of internal combustion engines in irrigation pumps; therefore, the program may be used by growers to further reduce criteria pollutant emissions.

Mitigated emissions are provided in Table 3-4. Implementation of these mitigation measures would reduce VOC and NO<sub>x</sub> emissions to less than significant.

**Table 3-4. Mitigated Peak Daily Emissions (lbs/day)**

| Water Agency                               | VOC | NO <sub>x</sub> | CO  | SO <sub>x</sub> | PM <sub>10</sub> | PM <sub>2.5</sub> |
|--------------------------------------------|-----|-----------------|-----|-----------------|------------------|-------------------|
| Feather River AQMD                         |     |                 |     |                 |                  |                   |
| Pleasant Grove-Verona Mutual Water Company | 9   | 25              | 191 | 54              | 1                | 1                 |
| CEQA Significance Threshold                | 25  | 25              | n/a | n/a             | 80               | n/a               |

Key:

AQMD = air quality management district; CEQA = California Environmental Quality Act; CO = carbon monoxide; lbs/day = pounds per day; n/a = not applicable; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = inhalable particulate matter; PM<sub>2.5</sub> = fine particulate matter; SO<sub>x</sub> = sulfur oxides; VOC = volatile organic compound

As discussed above, in addition to the CEQA significance thresholds, the federal general conformity regulations apply to a proposed federal action in a nonattainment or maintenance area if the total of direct and indirect emissions of the relevant criteria pollutants and precursor pollutants caused by the proposed action equal or exceed certain de minimis amounts (40 CFR 93.153). Because the general conformity regulations and thresholds only apply to nonattainment or maintenance areas, emissions subject to general conformity are less than the total project emissions. Figure 3-1 shows the CO maintenance area; Figure 3-2 shows the O<sub>3</sub> nonattainment area; Figure 3-3 shows the PM<sub>10</sub> maintenance area; and Figure 3-4 shows the PM<sub>2.5</sub> nonattainment area.

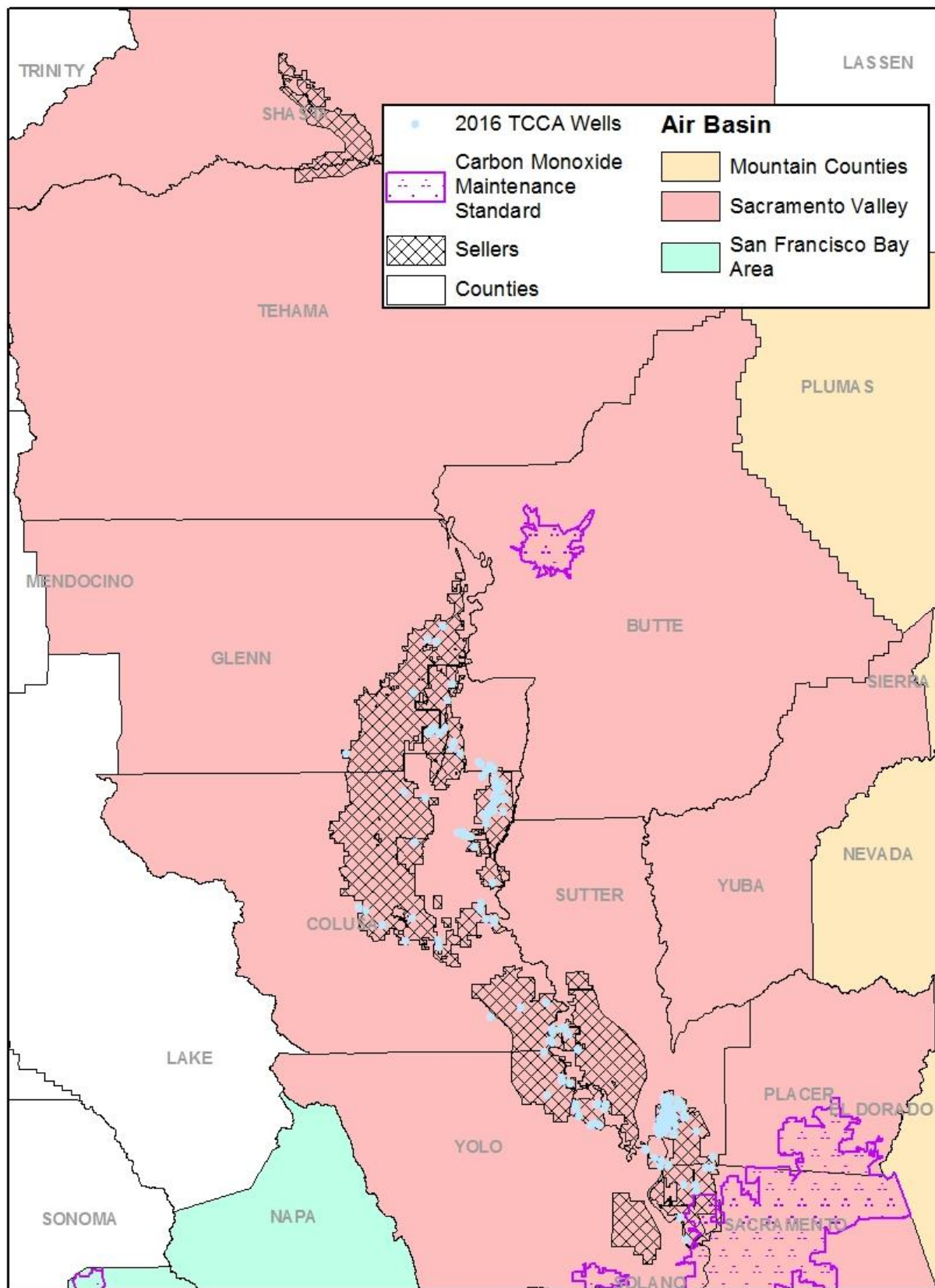


Figure 3-1. Location of CO Maintenance Area in Seller Service Area

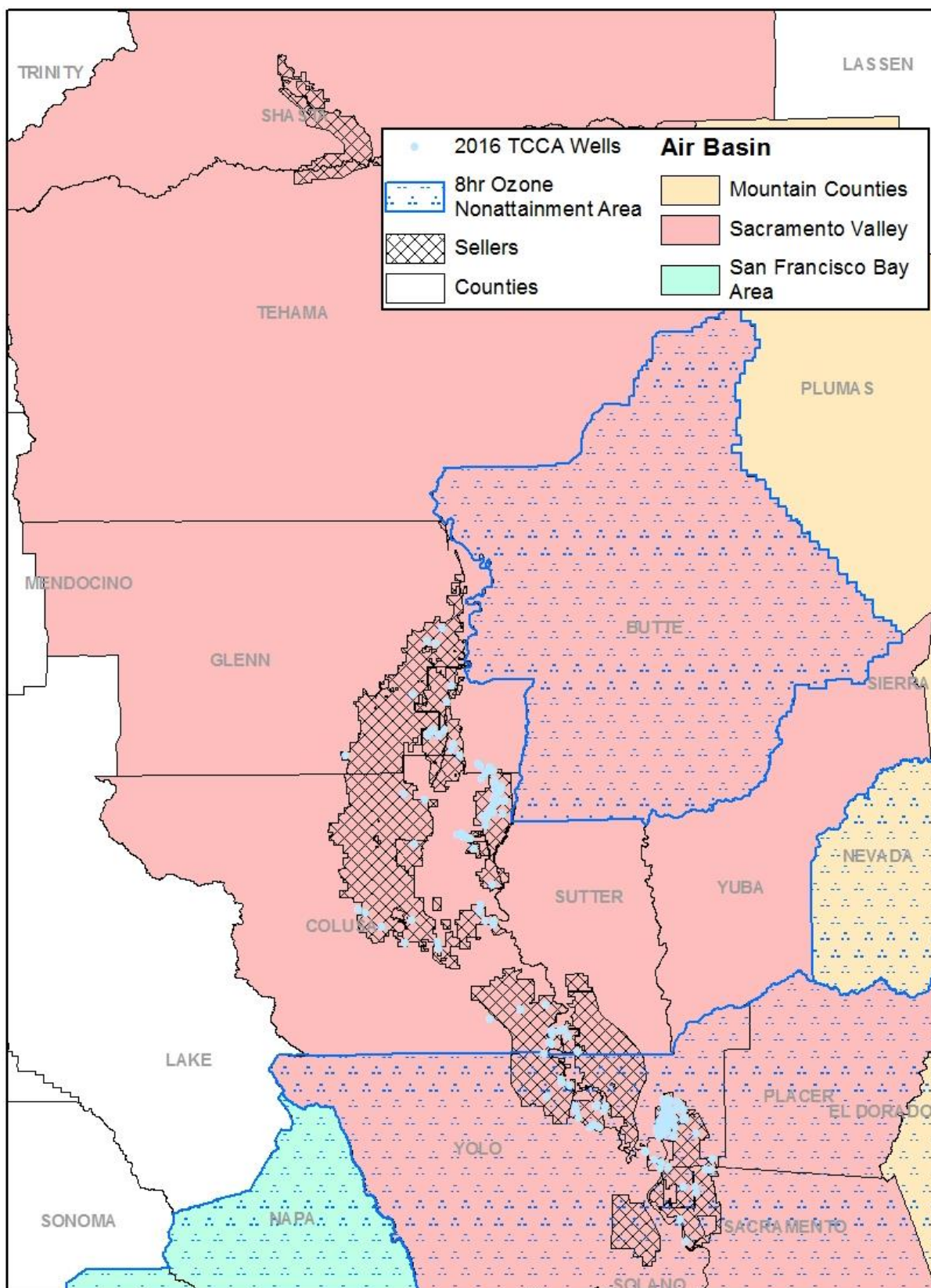


Figure 3-2. Location of O<sub>3</sub> Nonattainment Area in Seller Service Area

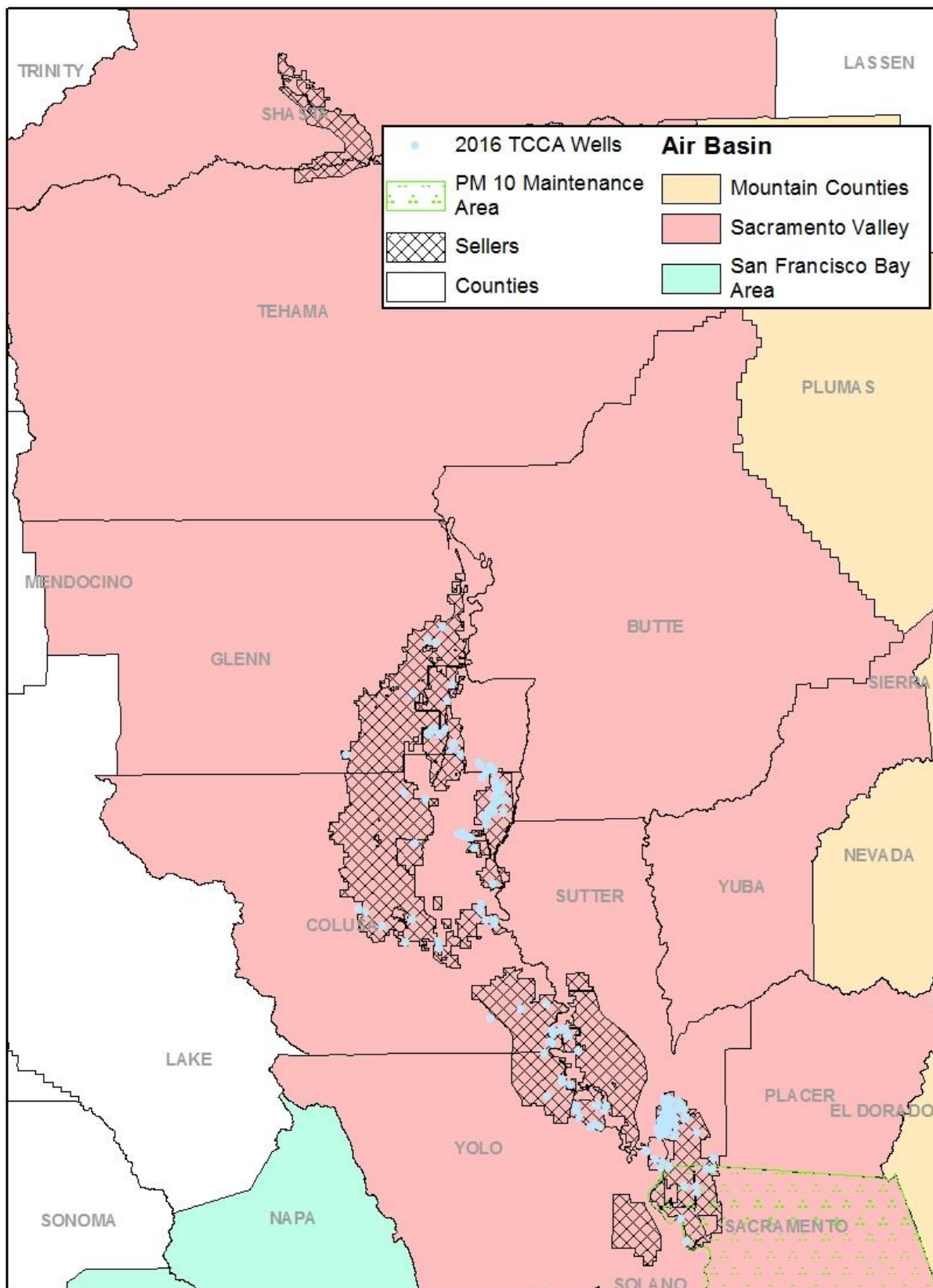


Figure 3-3. Location of PM<sub>10</sub> Maintenance Area in Seller Service Area

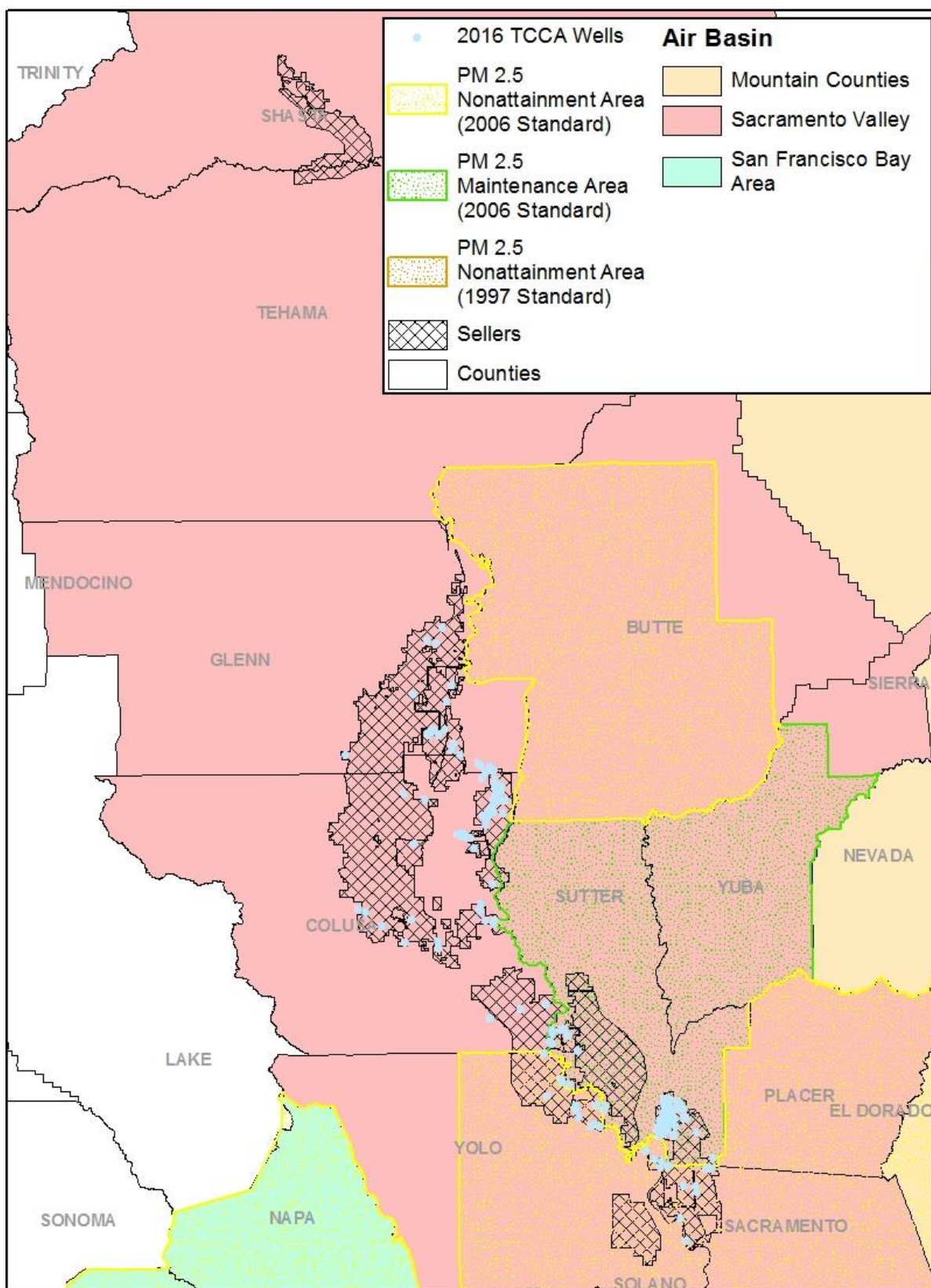


Figure 3-4. Location of PM<sub>2.5</sub> Nonattainment Area in Seller Service Area

Because the CEQA-related mitigation measures are fully enforceable under Cal. Pub. Res. Code §21081.6 and would be a requirement of project implementation, mitigated emissions for the Proposed Action were compared to the general conformity de minimis thresholds. Table 3-5 summarizes the general conformity applicability evaluation.

**Table 3-5. General Conformity Applicability Evaluation (tons per year)**

|                        | VOC <sup>1</sup> | NOx <sup>1</sup> | CO <sup>2</sup> | SOx <sup>3</sup>            | PM <sub>10</sub> | PM <sub>2.5</sub> <sup>4</sup> |
|------------------------|------------------|------------------|-----------------|-----------------------------|------------------|--------------------------------|
| Emissions <sup>5</sup> | 1                | 6                | <1              | 4                           | <1               | <1                             |
| Classification         | Severe           | Severe           | Maintenance     | PM <sub>2.5</sub> Precursor | Maintenance      | Nonattainment                  |
| De Minimis Threshold   | 25               | 25               | 100             | 100                         | 100              | 100                            |
| Exceed Threshold?      | No               | No               | No              | No                          | No               | No                             |

Notes:

- <sup>1</sup> The Sacramento Metro 8-hour O<sub>3</sub> nonattainment area consists of Sacramento and Yolo Counties and parts of El Dorado, Placer, Solano, and Sutter Counties. Emissions occurring within the attainment area of these counties are excluded from the total emissions.
- <sup>2</sup> The Sacramento Area CO maintenance area is based on the Census Bureau Urbanized Area and consists of parts of Placer, Sacramento, and Yolo Counties. The general conformity applicability evaluation is based on emissions that would occur within the entire county to be conservative.
- <sup>3</sup> All counties are designated as attainment areas for SO<sub>2</sub>; however, since SO<sub>2</sub> is a precursor to PM<sub>2.5</sub>, its emissions must be evaluated under general conformity.
- <sup>4</sup> The 24-hour PM<sub>2.5</sub> nonattainment area for Sacramento includes Sacramento County and parts of El Dorado, Placer, Solano, and Yolo Counties. The general conformity applicability analysis assumes that all emissions that could occur within each county would occur within the Sacramento nonattainment area to be conservative.
- <sup>6</sup> VOC and NOx emissions are excluded from Sutter County for Pelger Road 1700 LLC, Pelger Mutual Water Company, and Reclamation District 1004 because they are located in areas designated as attainment for the federal 8-hour O<sub>3</sub> NAAQS.

Key:

CO = carbon monoxide; NOx = nitrogen oxides; PM<sub>10</sub> = inhalable particulate matter; PM<sub>2.5</sub> = fine particulate matter; SOx = sulfur oxides; VOC = volatile organic compound

Mitigated emissions would be less than the general conformity de minimis thresholds; therefore, no further action would be required under general conformity. Detailed calculations are provided in Appendix D.

### c) Less than Significant

**No Action Alternative:** As described previously, the No Action Alternative would not change emissions relative to existing emissions. Because emissions would not increase, the No Action Alternative would not result in a cumulative impact to air quality.

**Proposed Action:** All counties affected by the Proposed Action are located in areas designated nonattainment for the PM<sub>10</sub> CAAQS. Additionally, Sacramento, Shasta, Tehama, and Yolo Counties are designated nonattainment for the O<sub>3</sub> CAAQS, while Sutter County is designated nonattainment-transitional for the O<sub>3</sub> CAAQS. Nonattainment status represents a cumulatively significant impact within the area. O<sub>3</sub> is a secondary pollutant, meaning that it is formed in the atmosphere from reactions of precursor compounds under certain conditions. Primary precursor compounds that lead to O<sub>3</sub> formation include volatile organic compounds and nitrogen oxides; therefore, the

significance thresholds established by the air districts for VOC and NO<sub>x</sub> are intended to maintain or attain the O<sub>3</sub> CAAQS and NAAQS. Because no single project determines the nonattainment status of a region, individual projects would only contribute to the area's designation on a cumulative basis.

Several air districts, including the Sacramento Metropolitan AQMD (2014b), develop significance thresholds to determine if a project's individual emissions could result in a cumulatively considerable adverse contribution to the existing air quality conditions. Therefore, if an alternative would produce air quality impacts that are individually significant, then the alternative would also be cumulatively considerable. Conversely, if the alternative's emissions would be less than the significance thresholds, then the alternative would not be expected to result in a cumulatively considerable contribution to the existing significant cumulative impact.

The Proposed Action could exceed NO<sub>x</sub> and VOC standards (O<sub>3</sub> precursors) in areas that are in nonattainment for O<sub>3</sub>, which would be a cumulatively considerable effect. However, implementation of mitigation measure AQ-1 would reduce individual impacts to less than significant and reduce the cumulative contribution. Therefore, air quality impacts would not be cumulatively considerable.

#### **d) Less than Significant**

**No Action Alternative and Proposed Action:** The proposed engines would either be remotely located in rural areas or would be located on existing agricultural land. The engines would not be located within one-quarter mile of a sensitive receptor. Additionally, emissions from individual engines would not exceed any district's significance criteria. Therefore, air quality impacts would be less than significant.

#### **e) No Impact**

**No Action Alternative and Proposed Action:** The use of diesel engines during groundwater substitution activities may generate near-field odors that are considered a nuisance. Diesel equipment emits a distinctive odor that may be considered offensive to certain individuals. The local air districts have rules (e.g., Sacramento Metropolitan AQMD Rule 402) that prohibit emissions that could cause nuisance or annoyance to a considerable number of people. All water agencies would operate their engines in compliance with the local rules and regulations. Therefore, the proposed operation of any diesel-fueled engines would have a less than significant impact associated with the creation of objectionable odors affecting a substantial number of people.

#### IV. BIOLOGICAL RESOURCES

– Would the project:

|                                                                                                                                                                                                                                                                                                                      | Potentially<br>Significant<br>Impact | Less Than<br>Significant<br>with<br>Mitigation<br>Incorporation | Less Than<br>Significant<br>Impact  | No<br>Impact                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------|-------------------------------------|-------------------------------------|
| a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in City or regional plans, policies, regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?                                                                  | <input type="checkbox"/>             | <input checked="" type="checkbox"/>                             | <input type="checkbox"/>            | <input type="checkbox"/>            |
| c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?                                                 | <input type="checkbox"/>             | <input checked="" type="checkbox"/>                             | <input type="checkbox"/>            | <input type="checkbox"/>            |
| d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?                                                                                   | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?                                                                                                                                                                                  | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?                                                                                                                                 | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |

**a) Less than Significant Impact**

**No Action Alternative:** Continued dry hydrologic conditions could affect special status fish species. Reclamation and DWR may have difficulty meeting the operational requirements of the Biological Opinions on the Continued Long-term Operations of the CVP/SWP and D1641. In December 2015, the State Water Resource Control Board (SWRCB) approved an order that largely upholds the February 2015 Temporary Urgency Change Petition (TUCP), but added new provisions to ensure the CVP plans to maintain minimum reservoir storage levels in Shasta and Folsom reservoirs. A primary purpose of the February TUCP Order was to preserve additional cold water storage in Shasta Reservoir to protect endangered winter-run Chinook salmon from temperature impacts during their fall spawning period. The December 2015 Order is intended to ensure that actions are taken to protect fisheries and maintain salinity in the Delta (SWRCB 2015). CVP and SWP operations on the Sacramento, Feather, and American rivers will be managed adaptively to meet environmental and water quality standards that are put in place throughout the water year. Reclamation and DWR will continue to coordinate closely with the SWRCB to balance the need to provide water supplies south of the Delta, and protect water quality in the Delta.

Under No Action Alternative, growers in the sellers' area would idle crops if surface water supplies are reduced. Rice idling actions could have an adverse effect to GGS that use flooded rice fields for foraging and protective cover habitat during the summer months. Rice idling would have similar adverse effects to pacific pond turtle.

Because of the multi-year dry conditions, refuge surface water supplies may be reduced in 2016. A reduction in available water supply to refuges and rice growers would result in less available habitat for migratory bird species.

**Proposed Action:**

**Fishery Resources**

Under the Proposed Action, transfer water would be released from Shasta Reservoir based on agricultural irrigation patterns. Sacramento River flows would slightly decrease from the TCCA point of diversion at Red Bluff to the point of diversion of the seller, located downstream, during the transfer period. The largest change in flow could be approximately 400 cfs in June. For comparison, flows in the Sacramento River near Colusa averaged 6,315 cfs in June 2014 and 4,314 cfs in June 2015 (DWR 2015b). The transfers would not affect flows downstream of the point where water would have been diverted if a transfer did not occur, therefore flows into the Delta would not be affected. The changes up to 400 cfs in Sacramento River flows (6 percent of June 2014 flows and 9 percent of June 2015 flows) would not be substantial enough to affect special status fish species. Adult migration by special status fish species, including, Chinook salmon, steelhead, and green sturgeon would not be affected

by slightly decreased flows. This magnitude of flow decrease would not reduce spawning habitat availability and incubation, increase redd dewatering or juvenile stranding, or reduce the suitability of habitat conditions during juvenile rearing of these species. Because the decrease in flow in the Sacramento River would be so minor, impacts to special status aquatic species in the Sacramento River would be less-than-significant. Reclamation is consulting frequently with USFWS and NMFS on CVP and SWP operations relative to special status fish species.

Special status fish species in the Delta would not be affected by the Proposed Action because flows downstream of the sellers' points of diversion would not change from the No Action Alternative.

#### *Groundwater Substitution*

Groundwater substitution transfers under the Proposed Action would reduce groundwater levels and potentially deplete surface water flows in rivers and creeks (see Section IX (b)). Surface water depletions in the Sacramento and American rivers as a result of groundwater substitution transfers would not be substantial, nor would they be of sufficient magnitude to affect special status fish species.

Reduced surface water flows in smaller creeks could affect special status fish species. Based on a review of field sampling data and reports, this analysis concluded that there is no evidence of the presence of special-status fish species in the following creeks and any streamflow depletion would have no effects on special status fish species: Walker Creek, French Creek, Willow Creek, South Fork Willow Creek, Funks Creek, Stone Corral Creek, Lurline Creek, Cortina Creek, Sand Creek, Sycamore Slough (Colusa County), Wilkins Slough Canal, Honcut Creek, North Honcut Creek, South Honcut Creek, and Dry Creek (tributary of Bear River).

The Proposed Action could have an adverse impact on fish habitat if it resulted in decreased flows to a degree that would substantially affect riverine, riparian, or wetland habitats in a river or stream, or interfere with fish movement or access to or from areas where the fish spawns. This degree of decreased flow is measured as both a minimum change in flow of one cfs and a ten percent change in mean flow (where quantitative flow data were available). A qualitative assessment was applied in instances where quantitative flow data were not available. The one cfs minimum flow threshold was used as a conservative measure of detectability by a fish. The ten percent threshold was used to determine measurable flow changes based on several major legally certified environmental documents in the Central Valley related to fisheries (Trinity River Mainstem Fishery Restoration Record of Decision, December 19, 2000; San Joaquin River Agreement Record of Decision in March 1999; Freeport Regional Water Project Record of Decision, January 4, 2005; Lower Yuba Accord EIR/EIS, Long-Term Water Transfers Record of Decision, 2015). If either of these thresholds were reached, further evaluation of fishery impacts was conducted to determine adverse impacts.

For creeks with the presence of special status fish species, the groundwater modeling estimated there would be a less than one cfs reduction in average monthly flow in Big Chico Creek, Stony Creek, Salt River, Little Chico Creek, and Putah Creek. A flow reduction of one cfs or less is not of sufficient magnitude to affect special status fish species.

There would be changes in flows greater than one cfs in Colusa Basin Drain, Coon Creek, Eastside Cross Canal, Cache Creek and Butte Creek. Historical stream flow information from the U.S. Geological Survey were gathered where available and used as the measure of baseline flow. For locations for which historical flow data were unavailable, a quantitative analysis was not possible; thus a qualitative discussion of potential impacts is included for these locations.

Based on available historic flow data, changes in stream flows in Colusa Basin Drain and Butte Creek would be less than ten percent of monthly average stream flows. In Colusa Basin Drain monthly decreases in flows due to the Proposed Action would range from zero percent to 0.1 percent of monthly historic flows from 1998 to 2015. In Butte Creek, monthly decreases in flows due to the Proposed Action would range from 0.6 percent to 2.5 percent of monthly historic flows from 2007 to 2015. These flow changes would be small, and the habitat for special status species in these waterbodies would not be substantially affected by the Proposed Action.

In Cache Creek, monthly decreases in flows due to the Proposed Action would range from zero percent to 12.7 percent of monthly historic flows from 2008 to 2015. The decrease of 12.7 percent occurs only once in August, when Cache Creek average stream flow is low, about 1.5 cfs, and the Proposed Action would decrease flows by about 0.19 cfs. There are no special status fish species expected to be in Cache Creek during August in dry years. In dry years, there is no passable connection for fish between the Delta and mouth of Cache Creek (Sacramento River Watershed Program 2010). Impacts to special status fish species in Cache Creek would be less than significant.

Historical flow data was limited for Coon Creek; data was available for two years from 2003 to 2005. Based on the Sacramento Valley Hydrologic Index, 2003 and 2005 were above normal years and 2004 was a below normal year. Between 2003 and 2005, December through March flows ranged from 50 cfs to 200 cfs. Flows in April and May ranged from 20 to 40 cfs (Bergfeld, pers. comm., 2014). Based on the groundwater modeling, drawdown over 1 cfs would occur in February, March, April, and May following the groundwater substitution transfers. If Coon Creek flows are at the low end of the range, there could be a slighter greater than 10 percent reduction in flows in March and April because the model shows a reduction of flows of 5.5 cfs in March and 4 cfs in April. This calculation represents a worst case scenario because baseline flows used in this calculation are at the low end of existing flow data range during 2003-2005. If the calculation included the mid- or high end of the range for baseline flows identified above, the reduction due to Proposed Action would

be less than ten percent. Therefore, this flow reduction would likely occur less frequently than assumed. As a result, it is concluded that effects of the Proposed Action to fisheries resources in Coon Creek would be less than significant.

Historical flow data was not available for East Side/Cross Canal. The East Side Canal serves as a flood management structure with a major levee on the west side of the canal that intercepts all of the watersheds north of the community of Pleasant Grove in Sutter County, including Coon Creek, Markham Ravine, and Auburn Ravine. The canal collects flood waters, natural flows, and agricultural return flows and has a design capacity of up to 16,000 cfs (DWR 2010). Riparian vegetation is generally absent due to periodic levee maintenance and herbicide applications on adjacent farmlands. However, the channel does have a variety of rooted aquatic vegetation, such as cattails, and riparian shrubs including willows. The area provides a variety of habitats for fish and numerous other wildlife species (County of Placer 2002). The Cross Canal is the outlet channel for all of the watersheds intercepted by the East Side Canal and those from the south, including Curry Creek, and Pleasant Grove Creek (County of Placer 2002). The groundwater model estimates up to a 14 cfs reduction in flow in August and 12 cfs reduction in flow in September. Based on the number of water bodies that drain into the East Side/Cross Canal and the large design capacity of the canal, it is unlikely that a 12 to 14 cfs reduction would substantially reduce the limited fish habitat in the canal. As a result, it is concluded that effects of the Proposed Action to fisheries resources in East Side/Cross Canal would be less than significant.

## **Terrestrial Resources**

### *Cropland Idling*

The following is a discussion of effects of rice idling actions on special status wildlife species that are present in the sellers' area. Environmental Commitments have been incorporated into the Proposed Action to reduce potential impacts to special status wildlife species. The Environmental Commitments are listed in Section 2.3. Additional special status animal and plant species have the potential to occur in the project area, but would not be affected by the Proposed Action. Appendices A and B list special status animal and plant species that could be present in the project area and the reason for the no effect determination.

Rice idling could affect special status species that use rice fields for forage, cover, nesting, breeding, or resting. Under the Proposed Action, a maximum of 50,771 acres of rice could be idled in Colusa, Glenn, Sutter, and Yolo counties based on the transfer quantities in Table 2-3 and an ETAW of 3.3 acre-feet per acre for rice. Table 3-6 shows the annual rice acreages in each county from 2002 to 2013.

**Table 3-6. Annual Harvested Rice Acreage by County in Sellers' Area**

| Year              | Glenn  | Colusa  | Sutter  | Yolo   | Total   |
|-------------------|--------|---------|---------|--------|---------|
| 2002              | 92,382 | 134,300 | 96,224  | 32,446 | 355,352 |
| 2003              | 87,793 | 127,350 | 93,654  | 37,303 | 346,100 |
| 2004              | 86,017 | 150,130 | 121,131 | 45,655 | 402,933 |
| 2005              | 88,876 | 136,400 | 97,801  | 34,670 | 357,747 |
| 2006              | 82,436 | 142,600 | 92,984  | 29,997 | 348,017 |
| 2007              | 82,668 | 148,550 | 108,241 | 32,660 | 372,119 |
| 2008              | 77,770 | 150,200 | 92,344  | 30,057 | 350,371 |
| 2009              | 89,483 | 152,400 | 109,766 | 36,593 | 388,242 |
| 2010              | 88,209 | 154,000 | 115,000 | 41,400 | 398,609 |
| 2011              | 84,900 | 149,000 | 112,000 | 42,500 | 388,400 |
| 2012              | 84,800 | 150,000 | 116,000 | 40,500 | 391,300 |
| 2013              | 85,300 | 149,000 | 116,000 | 38,400 | 388,700 |
| Average (2009-13) | 86,538 | 150,880 | 113,753 | 39,879 | 391,050 |

Source: USDA 2003-2015

### ***Giant Garter Snake***

Rice idling actions could affect the GGS that use flooded rice fields for foraging and protective cover habitat during the summer months. GGS require water during their active phase, extending from spring until fall. During the winter months, GGS are dormant and occupy burrows in upland areas. While the preferred habitat of GGS is natural wetland areas with slow moving water, GGS use rice fields and their associated water supply and tail water canals as habitat, particularly where natural wetland habitats are not available. Because of the historic loss of natural wetlands, rice fields and their associated canals and drainage ditches have become important habitat for GGS.

Rice idling would affect available habitat for GGS. The GGS displaced from idled rice fields would need to find other areas to live and may face increased predation risk, competition, and reduced food supplies. This may lead to increased mortality, reduced reproductive success, and reduced condition prior to the start of the overwintering period. Rice idling transfers would be subject to the Environmental Commitments described in Section 2.3, which include numerous measures to protect GGS.

As included in the Environmental Commitments, Reclamation will coordinate with USFWS and GGS experts to identify priority suitable habitat for GGS and discourage idling in those priority areas. The Environmental Commitment requires sellers to ensure that priority habitat areas with a high probability for GGS occurrence will not be idled. Recent work by the USGS suggests that giant garter snake are most likely to occur within areas of historic tule marsh, and the likelihood of encountering them drops substantially with distance from these areas of historic habitat (Halstead et al. 2014). Therefore, the Environmental Commitment to minimize idling in priority habitats, such as lands adjacent to naturalized lands and refuges and corridors between these

areas, and areas of historic tule marsh would protect areas with high likelihood of GGS occurrence. Implementation of Environmental Commitments will also protect movement corridors for GGS by maintaining water in irrigation ditches and canals. This Environmental Commitment also keeps emergent aquatic vegetation intact for giant garter snake escape cover and foraging. By maintaining water in agricultural ditches, some GGS would successfully relocate to find alternate forage, cover, and breeding areas. The Environmental Commitments also help minimize impacts to GGS by requiring sellers to ensure that adequate water is available for priority habitat areas by preventing sellers from idling lands in priority habitat areas with a high likelihood for GGS occurrence and requiring sellers to allow Reclamation to access idled land to verify implantation of the Environmental Commitments. An Environmental Commitment is also for sellers to continue to voluntarily perform GGS best management practices, including educating maintenance personnel to recognize and avoid contact with GGS, cleaning only one side of a conveyance channel per year, and implementing other measures to enhance habitat for GGS.

Rice idling under the Proposed Action would have a less than significant impact on GGS because the Environmental Commitments would avoid or reduce many of the potential impacts associated with displacement of GGS. Some individual snakes would be exposed to displacement and the associated increased risk of predation, reduced food availability, increased competition, and potentially reduced fecundity. The number of individual snakes affected is expected to be small because Environmental Commitments avoid areas known to be priority habitat for GGS or where GGS populations are known to occur. The Environmental Commitment to maintain water in canals near idled fields would also protect GGS. In addition, a relatively small proportion of the rice acreage (no more than 13 percent of average annual rice acreage from 2009 to 2013) would be affected.

#### ***Pacific Pond Turtle***

Ditches and drains associated with rice fields provide suitable habitat for the pacific pond turtle. Actions that result in the desiccation of aquatic habitat could result in the turtle migrating to new areas, which in turn puts them at an increased risk of predation. An Environmental Commitment requires that sellers maintain adequate water in major irrigation and drainage canals to provide movement corridors for aquatic species, including the pond turtle. This would be implemented in areas where cropland idling or crop shifting occurs. 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 would be sufficient. This Environmental Commitment minimizes impacts to pacific pond turtle because it would maintain aquatic habitat for the turtle and the opportunity to migrate to new areas. Therefore, effects to the pacific pond turtle of cropland idling transfers would be less than significant.

***Special Status Bird Species and Migratory Birds***

Many migratory bird species use seasonally flooded agricultural land for nesting and forage habitat during the summer rearing season. Among these are special-status species such as the black tern, which uses flooded rice land and emergent vegetation for foraging (for insects and small vertebrates) and for nesting. Reduction of seasonally flooded agricultural habitat could adversely affect local populations of special status species such as the black tern. However, the decisions regarding crop shifting/idling would have already been made prior to the onset of the species breeding season (May through August), such that terns returning to the area would be able to select appropriate nesting sites for that year. The maximum amount of rice idling would be 50,771 acres, which is a small percentage of the average acreage (391,050 acres) of rice harvested in the project vicinity. Therefore, nesting habitat would be available in active rice fields nearby. This species would also benefit from Environmental Commitments aimed at the protection of GGS because commitments would minimize idling near wildlife refuges and areas of historic tule marsh that provide important habitat for terns. The Environmental Commitment to maintain water in canals near idled fields would also protect the tern by supporting emergent vegetation in canals for forage on small aquatic insects, emergent plants, and seeds.

Special-status bird species including bank swallows and tricolored blackbirds forage in rice fields near their nesting colonies. Tricolored blackbirds may use rice fields year-round and would also use emergent vegetation in return ditches and irrigation canals associated with the seasonally flooded fields. The rice agriculture cycle provides insect forage in the flooded fields during the summer and waste grain forage over winter. Rice idling could affect the populations foraging distribution behavior and patterns and could reduce foraging and breeding habitat for these species. Implementing the Environmental Commitments that minimize idling near wildlife refuges and in priority habitat for GGS would help avoid or minimize these potential impacts because they would maintain forage and breeding habitat. The Environmental Commitment to maintain water in canals near idled fields would also protect bank swallows and tricolored blackbirds by supporting emergent vegetation in canals for forage on small aquatic insects, emergent plants, and seeds.

In addition, many raptors forage in summer and/or winter over rice fields, preying on various wildlife, including waterfowl. A reduction in the number of waterfowl or other prey could affect local populations. Environmental Commitments, including avoiding crop idling near wildlife refuges and established wildlife areas, would reduce this impact because it would support local populations of waterfowl that could be preyed upon by raptors.

For the millions of birds that use rice fields during winter migration, this small reduction in crops planted is not expected to affect the amount of post-harvest flooded agriculture that provides important winter forage for migratory birds, particularly waterfowl and shorebirds. Farmers in the Sacramento Valley only

flood-up a fraction of the cropland planted; typically around 60 percent in normal water years (Miller et al 2010, Central Valley Joint Venture 2006) and as little as 15 percent in critically dry years (Buttner 2014). The decision on whether to flood is not based on what was produced for the year but instead is determined by the availability of fall and winter water. Growers receive a separate water supply in fall and winter for rice decomposition. Particularly during drier years (when transfers occur), the amount of land flooded is limited by availability of fall water supply rather than the amount of land that was planted during the irrigation season. Because the Proposed Action does not include transfers of rice decomposition water or otherwise affect the availability of fall and winter water, it would not change the availability of water for post-harvest flooding and therefore would not result in a reduction of winter foraging and resting habitat for migrating birds.

The location of cropland idling does have the potential to affect the use of historic roost sites, particularly for sandhill cranes, which exhibit site fidelity (Zeiner et al. 1990), typically returning to the same location each year to winter. Idling fields or crop shifting within areas that sandhill cranes historically return to may affect their wintering distribution patterns due to reduced forage availability on idled or crop shifted fields. Although the birds would disperse as their main food source diminishes, cropland idling and/or crop shifting could affect the timing of dispersal and could negatively affect those individuals that have not had sufficient time to prepare for winter migration. Environmental Commitments include avoiding cropland idling near wildlife refuges and established wildlife areas that provide core wintering areas for sandhill crane to reduce impacts to the local crane population by preserving these roosting and foraging habitat areas to which the cranes return each year.

The Proposed Action would have a less than significant impact on migratory birds, including special status species, associated with seasonally flooded agriculture habitat because the maximum reduction in rice production would be within the historic range of variation, cropland idling/shifting would be minimized in known wintering areas that support high concentrations of wintering waterfowl and shorebirds, and water transfers would not include rice decomposition water and so would not reduce the availability of post-harvest forage.

#### **b, c) Less than Significant Impact**

**No Action Alternative:** Flow and elevation changes within the river and reservoirs due to the past years' dry weather conditions, lack of precipitation, and limited snow pack have resulted in existing adverse conditions for managed and unmanaged wetlands. As a result of decreased flow in rivers, there would be limited or no connection between the riparian areas and wetlands in floodplains associated with these rivers. Reservoir water surface elevations continue to fall and many of the large reservoirs, such as Shasta, Folsom, and Oroville, already have water levels hundreds of feet from their bathtub ring of

wetlands and riparian areas. Cropland idling under the No Action Alternative in response to water shortages would reduce the amount of tail water that flows to wetlands.

**Proposed Action:** Under the Proposed Action, Reclamation would deliver the transferred water to TCCA Member Units on the same schedule that it would have been delivered to the seller if no transfer occurred. This operation would result in a small change in flow between the TCCA diversion and the point where water would have been diverted without the transfer. The largest change in flow would be about 400 cfs in June (if the Sacramento River Settlement Contractors receive 100 percent of the Contract Total). Flows in the Sacramento River near Colusa averaged 6,315 cfs in June 2014 and 4,314 cfs in June 2015 (DWR 2015b). The transfers would not affect flows downstream of the point where water would have been diverted if a transfer did not occur, so flows into the Delta would not be affected. The Proposed Action would result in minor effects to any riparian habitat near the rivers. There would not be any dewatering of root zones to such an extent to cause die back of riparian tree and shrub foliage, branches or entire plants. Impacts would be less than significant.

As discussed in (a), groundwater substitution transfers could result in streamflow depletion in rivers and creeks, which could directly impact natural communities by changing the timing and volume of flows within rivers. Natural communities potentially affected include valley/foothill riparian, managed and natural seasonal wetlands. In the Sacramento and American rivers, there would be minor changes in flow due to transfers and there would be no associated effects to natural communities.

An initial screening evaluation of modeled flows in several smaller creeks was conducted. If the flow reduction caused by implementing the transfer would be one cfs or less, then no further analysis was required because the effect was considered too small to have a substantial effect on natural communities and terrestrial species. Based on these criteria, the evaluation concluded that impacts to natural communities in the following waterways are less than significant: Deer Creek, Antelope Creek, Paynes Creek, Seven Mile Creek, Elder Creek, Mill Creek (in Tehama County), Thomes Creek, Mill Creek (Thomes Creek tributary), Auburn Ravine, Honcut Creek, Freshwater Creek, Funks Creek, Stony Creek, Putah Creek, Spring Valley Creek, Dry Creek (tributary to Bear River), Walker Creek, North Fork Walker Creek, Big Chico Creek, Little Chico Creek, and the South Fork of Willow Creek.

If flow reductions were estimated greater than one cfs in one month, then a second screening evaluation was conducted to evaluate effects to natural communities. Similar to the fisheries analysis described above, flow reductions greater than a ten percent change in mean monthly flow was assumed to have a potential impact to natural communities and required further evaluation.

There would be changes in flows greater than one cfs in Colusa Basin Drain, Coon Creek, Eastside Cross Canal, Cortina Creek, Cache Creek, Butte Creek, Lower Sycamore Slough, Willow Creek, and Stone Corral Creek, which could affect natural communities.

Based on available stream flow data, mean monthly changes in flow in Colusa Basin Drain and Butte Creek would be less than ten percent; therefore, reductions in stream flow would not be substantial enough to affect natural communities and impacts would be less than significant.

Measured flow data was not available for Stone Corral Creek. Glenn-Colusa Irrigation District supplements flows to Stone Corral Creek during the irrigation season and fall months by releasing irrigation water; therefore, flows would be maintained and would not affect natural communities. Impacts to Stone Corral Creek would be less than significant.

As described above, historical flow data was limited for Coon Creek. If Coon Creek flows are at the low end of the range of available data, there could be a slighter greater than ten percent reduction in flows in March and April because the model shows a reduction of flows of 5.5 cfs in March and 4 cfs in April. This calculation represents a worst case scenario because baseline flows used in this calculation are at the low end of existing flow data range during 2003-2005. If the calculation included the mid- or high end of the range for baseline flows, the reduction due to Proposed Action would be less than ten percent. Therefore, a large percentage of flow reduction would occur less frequently. As a result, it is concluded that effects of the Proposed Action to natural communities at Coon Creek would be less than significant.

Historical flow data was not available for East Side/Cross Canal. As described above, the East Side/Cross Canal is an actively managed flood management structure that collects flood waters, natural flows, and agricultural return flows from several water bodies. Riparian vegetation is generally absent due to periodic levee maintenance and herbicide applications on adjacent farmlands. However, the channel does have a variety of rooted aquatic vegetation, such as cattails, and riparian shrubs including willows. The groundwater model estimates up to a 14 cfs reduction in flow in August and 12 cfs reduction in flow in September. Because vegetation is managed near the canal, natural communities would not be affected. Aquatic vegetation in the canal would not be affected because the canal is a large flood facility that collect substantial drainage and a 12 to 14 cfs decrease would not likely be of a magnitude to affect vegetation in the canal. As a result, it is concluded that effects of the Proposed Action to natural communities in East Side/Cross Canal would be less than significant.

In Cache Creek, monthly decreases in flows due to the Proposed Action would range from zero percent to 12.7 percent of monthly historic flows from 2008 to 2015. The decrease of 12.7 percent occurs only once in August, when Cache

Creek average stream flow is low, about 1.5 cfs, and the Proposed Action would decrease flows by about 0.19 cfs. The reduction in stream flow would result in a significant adverse effect on riparian natural communities associated with Cache Creek. Implementation of Mitigation Measure GW-1, would reduce this effect to less than significant, because it requires monitoring of wells and implementing a mitigation plan if the seller's monitoring efforts indicate that the operation of the wells for groundwater substitution pumping are causing substantial adverse impacts.

Historical flow data are not available for Lower Sycamore Slough, Cortina Creek, and Willow Creek. The percentage change in flow in these streams due to the Proposed Action could not be determined. Flow reductions as the result of groundwater declines would be observed at monitoring wells in the region and adverse effects on riparian vegetation would be mitigated by implementation of Mitigation Measure GW-1. With implementation of Mitigation Measure GW-1, effects to natural communities would be less than significant.

Cropland idling transfers would reduce irrigation tail water flows to wetlands. Environmental Commitments limiting the amount of acres idled in historic tule marsh habitat, limiting cropland idling transfers near refuges, and maintaining water in ditches would support flows to existing wetlands by keeping cropland near wetlands irrigated. As a result, wetlands would continue to receive irrigation tail water flows from irrigated fields. The incremental effect to wetlands under the Proposed Action would be less than significant.

#### **d) Less Than Significant Impact**

**No Action Alternative:** The lack of available water due to critically dry conditions could affect movement corridors or nursery sites for GGS and other fish and wildlife. Wildlife that is dependent on water as a means of moving from one area to another may be unable to relocate due to the parched landscape. GGS present in areas of rice idling would have to move across dewatered habitat to find suitable areas with water. Moving across dewatered areas could expose snakes to a number of potential impacts associated with the need to relocate. These include the energetic costs associated with relocation, a reduction in food supplies associated with the decrease in habitat, increased predation, potential for increased competition in new habitats, and potentially reduced reproduction and recruitment for those individuals displaced. Dewatered areas could also affect movement of the pacific pond turtle that occupy drainage ditches and irrigation canals. Dewatering could require the turtle to migrate to new areas, which in turn puts them at an increased risk of predation.

**Proposed Action:** For species that use irrigated rice fields and drainage ditches for habitat, such as GGS and pacific pond turtle, these species would need to relocate to other suitable habitat and could be exposed to a number of potential

impacts associated with the need to relocate, as described above. Idling rice may affect the species' ability to move from one place to another if the movement corridor is dry and does not support vegetation for cover and refuge. The Environmental Commitments to maintain water in irrigation canals and to reduce idling in priority habitat maintain some habitat and movement corridors for species to relocate if necessary.

Maintenance water in smaller drains and conveyance infrastructure support key habitat attributes such as emergent vegetation which GGS and pacific pond turtle utilize for escape cover and foraging habitat. Ensuring water remains in these key habitats reduces the potential impact to suitable habitat and the need for GGS individuals and pacific pond turtle to relocate. Environmental Commitments would reduce potential impacts to movement corridors of GGS and pacific pond turtle; therefore, impacts would be less than significant.

#### **e, f) Less Than Significant Impact**

**No Action Alternative:** The Yuba-Sutter Regional Conservation Plan (YSRCP) and Natomas Basin Habitat Conservation Plan (HCP) are applicable to the project area. Both plans are regional strategies for conserving species and habitats while still allowing for economic development.

The YSRCP is both a state Natural Community Conservation Plan (NCCP) and a federal HCP. Sutter County serves as the lead in coordination and preparation of the YSRCP working with the other permit applicants, Yuba County, City of Yuba City, City of Wheatland, and City of Live Oak. The YSRCP covers some of the potentially affected species associated with the Proposed Action, including GGS, greater sandhill crane, and tricolored blackbird (Sutter County 2015). Specifically, the YSRCP considers the habitat function and value of agricultural lands for covered species and establishes a process for protection of agricultural areas and important habitat.

The Natomas HCP also covers some of the potentially affected species associated with the Proposed Action, including GGS and tricolored blackbird (The Natomas Basin Conservancy 2003). The Natomas HCP applies to the 53,537-acre area interior to the toe of levees surrounding the Natomas Basin, located in the northern portion of Sacramento County and the southern portion of Sutter County. The permittees to the plan are the City of Sacramento, Sutter County, Reclamation District No. 1000, Natomas Central Mutual Water Company and The Natomas Basin Conservancy. The Proposed Action does not include cropland idling transfers from the Natomas Central Mutual Water Company; therefore, there would not be any impacts to GGS in their service area.

Cropland idling under the No Action Alternative in response to water shortages would not conflict with the conservation objectives of the plans because of the limited amount of crop acreage that would be idled compared to the amount of

active cropland available. Cropland idling also would not include or result in any infrastructure for economic development. Increases in groundwater pumping could affect the water supplies needed to fulfill the water needs of the conservation banks and preserves established by some of these HCPs. For example, the Natomas Basin Habitat Conservation Plan, as implemented by the Natomas Basin Conservancy, relies on surface water supplies from Natomas Central Mutual Water Company and groundwater in water short years.

**Proposed Action:** Cropland idling under the Proposed Action would not conflict with the conservation objectives of the plans because of the limited amount of crop acreage that would be idled compared to the amount of active cropland available. Implementation of the Environmental Commitments would minimize effects to important habitat by maintaining water and aquatic vegetation within irrigation canals that provide habitat and movement corridors for GGS and minimizing cropland alteration near wildlife refuges that support the covered special status species.

Water transfers under the Proposed Action would have a less than significant impact on the natural communities that are covered in the plans because of the temporary nature of the transfers and the minimal changes in flows and reservoir levels associated with water transfers, as described above for Impacts b and c. The small change in flows would not adversely affect riparian habitat or wetlands associated with the Sacramento River, Shasta Reservoir, or small streams or have adverse effects to special status species covered that use these habitats. GW-1 also require sellers to address third-party impacts from groundwater substitution specifically in areas where groundwater subbasins include conservation banks or preserves for GGS. The Proposed Action would not conflict with HCP and NCCP provisions. Impacts would be less than significant.

## V. CULTURAL RESOURCES

– Would the project:

|                                                                                                                          | Potentially<br>Significant<br>Impact | Less Than<br>Significant<br>with<br>Mitigation<br>Incorporation | Less Than<br>Significant<br>Impact | No<br>Impact                        |
|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------|------------------------------------|-------------------------------------|
| a) Cause a substantial adverse change in the significance of a historical resource as defined in State CEQA §15064.5?    | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to State CEQA §15064.5? | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?                  | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| d) Disturb any human remains, including those interred outside of formal cemeteries?                                     | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |

**a-d) No Action Alternative.** The water elevations of Shasta Reservoir are very low due to dry hydrologic conditions. Under the No Action Alternative, these conditions may lead to the exposure of cultural resources that have been inundated for many years. In some cases, these water surface elevations may be historically low and the receding water may reveal cultural resources that have been inundated since 1977.

There would be no ground disturbing activities, land alteration, or construction proposed that could disturb historical, archeological, or paleontologic resources associated with the No Action Alternative.

**Proposed Action.** The decline of water surface elevations in Shasta Reservoir would be the result of the operation of those reservoirs to fulfill downstream regulatory requirements. Reclamation and DWR will release water from the CVP and SWP reservoirs to meet the operational requirements of the Biological Opinions on the Continued Long-term Operations of the CVP/SWP and D1641. Diversions for water transfer purposes would not result in release of any additional water from Shasta Reservoir. Operation of the reservoir would remain unchanged when compared to the No Action Alternative.

There would be no ground disturbing activities, land alteration, or construction proposed that could disturb historical, archeological, or paleontologic resources associated with the Proposed Action. Thus, there would be no disturbance impacts to existing or potential burial sites, cemeteries, or human remains interred outside of formal cemeteries.

A Reclamation archaeologist was consulted to ensure the Proposed Action would have no adverse impact on any historic properties. It was determined that this type of activity does not have the potential to cause effects on historic properties, if present, and Reclamation has no further obligation under National Historic Preservation Act Section 106, pursuant to 36 CFR Part 800.3(a)(1).

## VI. GEOLOGY AND SOILS

-- Would the project:

|                                                                                                                                                                                                                                                                                        | Potentially<br>Significant<br>Impact | Less Than<br>Significant<br>with<br>Mitigation<br>Incorporation | Less Than<br>Significant<br>Impact  | No<br>Impact                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------|-------------------------------------|-------------------------------------|
| a) Exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:                                                                                                                                                  |                                      |                                                                 |                                     |                                     |
| i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42. | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| ii) Strong seismic ground shaking?                                                                                                                                                                                                                                                     | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| iii) Seismic-related ground failure, including liquefaction?                                                                                                                                                                                                                           | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| iv) Landslides?                                                                                                                                                                                                                                                                        | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| b) Result in substantial soil erosion or the loss of topsoil?                                                                                                                                                                                                                          | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?                                                     | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |

## VI. GEOLOGY AND SOILS

-- Would the project:

|                                                                                                                                                                                      | Potentially<br>Significant<br>Impact | Less Than<br>Significant<br>with<br>Mitigation<br>Incorporation | Less Than<br>Significant<br>Impact | No<br>Impact                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------|------------------------------------|-------------------------------------|
| d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?                                     | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water? | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |

**a) No Impact.** There are no new facilities or construction proposed for the No Action Alternative or Proposed Action, and no existing facilities fall within an Alquist-Priolo Earthquake Fault Zone, as shown in the Interim Revision of Special Publication 42 of the Division of Mines and Geology, Fault Rupture Zones in California (California Department of Conservation 2007). Therefore, the No Action Alternative and Proposed Action would not expose people or structures to impacts related to fault rupture, ground shaking, ground failure, liquefaction, or landslides.

### b) Less than Significant

**No Action Alternative:** In 2016, surface water shortages may lead to increased cropland idling in both the seller and buyer districts. The soils in both buyer and seller areas consist of fine particles of clay, loam, some sand, and silty clays (U.S. Department of Agriculture [USDA] Natural Resources Conservation Service [NRCS] 2009a, 2009b, 2011, 2012). These soils are susceptible to wind erosion but have a relatively low wind erodibility index. The Natural Resource Conservation Service estimated in the 2010 Natural Resources Inventory that approximately 0.68 tons per acre of topsoil are eroded annually by wind from cultivated land, and 0.36 tons per acre of topsoil are eroded annually from non-cultivated land (USDA 2013).

Agricultural practices determine the amount of wind erosion to a greater extent than climate in the Sacramento Valley. Farming operations such as plowing, leveling, planting, weeding, mowing, cutting, and baling all increase wind erosion by stirring up or exposing top soil. Fallow fields experience a net reduction in wind erosion by avoiding these practices. Fine soils such as sand and silts erode at a higher rate than the clays and silty clays found in the project

area. Therefore, the soils in the project area have a relatively low risk of wind erosion when left in a dry and unplanted condition.

**Proposed Action:** Similar to the No Action Alternative, increased cropland idling in the Sacramento Valley to make water available for transfer is not likely to substantially increase wind erosion of sediments. Buyers are likely to use transferred water on permanent crops (such as orchards). The soils underlying these fields have a low risk of wind erosion; therefore, continued cultivation is not likely to substantially increase erosion.

**c) Less than Significant.** The project area is underlain by clay and is located in flat terrain. No new construction or ground disturbing actions are proposed for either the No Action Alternative or the Proposed Action that could result in on- or off-site landslide, lateral spreading, liquefaction, or collapse. Groundwater substitution transfers could reduce groundwater levels, which could decrease pore-water pressure and result in a loss of structural support for clay and silt beds. This impact is analyzed in more detail in the groundwater section of Hydrology and Water Quality. The analysis finds that the potential for land subsidence from increased groundwater pumping (under the No Action Alternative and the Proposed Action) would be small.

**d, e) No Impact.** There are no expansive soils known to exist in the project area. There are no septic tanks or alternative waste water disposal systems proposed or required for the No Action Alternative or Proposed Action. The Proposed Action does not include new construction, and thus no new waste water generation. Therefore, there would be no impact resulting from the implementation of the Proposed Action.

## VII. GREENHOUSE GAS

**EMISSIONS** - Would the project:

|                                                                                                                                  | Potentially<br>Significant<br>Impact | Less Than<br>Significant with<br>Mitigation<br>Incorporation | Less Than<br>Significant<br>Impact  | No<br>Impact             |
|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------------------------------|-------------------------------------|--------------------------|
| a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?      | <input type="checkbox"/>             | <input type="checkbox"/>                                     | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases? | <input type="checkbox"/>             | <input type="checkbox"/>                                     | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### a, b) Less than Significant

**No Action Alternative:** Future hydrologic conditions in 2016 may cause an increase or decrease in groundwater pumping and cropland idling in response to

surface water shortages. These actions will generally follow the pattern of what has happened during previous dry periods under existing conditions.

**Proposed Action:** This analysis estimates emissions using available emissions data and information on fuel type, engine size (hp), and annual transfer amounts included in the proposed alternatives. Existing emissions data used in the analysis includes:

- Diesel and natural gas fuel emission factors from The Climate Registry (TCR 2015a)
- Electric utility CO<sub>2</sub> emission factors from TCR (2015b)
- Emissions & Generation Resource Integrated Database (eGRID) CH<sub>4</sub> and N<sub>2</sub>O emission factors from USEPA (USEPA 2015b)
- “Comparison of Summertime Emission Credits from Land Fallowing Versus Groundwater Pumping” (Byron Buck & Associates 2009)

In 2009, Byron Buck & Associates completed a comparison of the relative reduction in emissions due to cropland idling activities versus groundwater substitution. Byron Buck & Associates estimated the gallons of fuel consumed by farm equipment that would be reduced per acre idled and the average quantity of fuel consumed by groundwater pumping. It was assumed that an agency would need 4.25 AF of water produced by idling to offset the equivalent emissions of one AF of groundwater pumped (Byron Buck & Associates 2009). Using this ratio, the expected reductions in vehicular exhaust emissions from cropland idling were estimated.

Each GHG contributes to climate change differently, as expressed by its global warming potential (GWP). GHG emissions are discussed in terms of CO<sub>2</sub> equivalent (CO<sub>2</sub>e) emissions, which express, for a given mixture of GHG, the amount of CO<sub>2</sub> that would have the same GWP over a specific timescale. CO<sub>2</sub>e is determined by multiplying the mass of each GHG by its GWP. This analysis uses the GWP from the Intergovernmental Panel and Climate Change Fourth Assessment Report (Forster et al. 2007) for a 100-year time period to estimate CO<sub>2</sub>e. This approach is consistent with the federal GHG Reporting Rule (40 CFR 98), as effective on January 1, 2014 (78 Federal Register 71904) and California’s 2000-2012 GHG Inventory Report (CARB 2014). The GWPs used in this analysis are 25 for CH<sub>4</sub> and 298 for N<sub>2</sub>O.

CARB uses a threshold of 25,000 metric tons CO<sub>2</sub>e per year as a threshold for including facilities in its cap-and-trade regulation (17 CCR 95800-96023). Because the goal of the regulation is to reduce GHG emissions statewide, this threshold was deemed appropriate to assess significance.

Groundwater substitution could increase GHG emissions in the seller area, while cropland idling transfers could reduce vehicle exhaust emissions. Cropland idling transfers could offset some of the emissions from groundwater substitution transfers, but the quantity of water transferred under each mechanism could be much less than what is included in Table 2-3. Therefore, impacts were evaluated for the full quantity of groundwater substitution, without regard for any potential offsets from idled land. Table 3-7 summarizes the GHG emissions associated with the Proposed Action. Detailed calculations are provided in Appendix E, Climate Change Analysis Emission Calculations.

**Table 3-7. Summary of Project GHG Emissions (MTCO<sub>2</sub>e per year)**

| Water Agency                               | CO <sub>2</sub> | CH <sub>4</sub> | N <sub>2</sub> O | Total         |
|--------------------------------------------|-----------------|-----------------|------------------|---------------|
| Anderson-Cottonwood Irrigation District    | 146             | <1              | 1                | 147           |
| Burroughs Farms                            | 123             | <1              | <1               | 124           |
| Canal Farms                                | 35              | <1              | <1               | 35            |
| Conaway Preservation Group                 | n/a             | n/a             | n/a              | n/a           |
| Eastside Mutual Water Company              | 616             | 1               | 2                | 618           |
| Guisti Farms                               | 898             | 1               | 3                | 902           |
| Glenn-Colusa Irrigation District           | 1,017           | 1               | 3                | 1,021         |
| Lewis Ranch                                | n/a             | n/a             | n/a              | n/a           |
| Maxwell Irrigation District                | 527             | 1               | 1                | 528           |
| Natomas Central Mutual Water Company       | 1,907           | 3               | 6                | 1,915         |
| Pelger Mutual Water Company                | 253             | <1              | 1                | 255           |
| Pelger Road 1700 LLC                       | 137             | <1              | <1               | 138           |
| Pleasant Grove-Verona Mutual Water Company | 1,317           | 2               | 4                | 1,323         |
| Princeton-Codora-Glenn Irrigation District | 1,312           | 1               | 3                | 1,316         |
| Provident Irrigation District              | 3,476           | 4               | 8                | 3,488         |
| Reclamation District 108                   | 620             | 1               | 2                | 624           |
| Reclamation District 1004                  | 998             | 1               | 3                | 1,002         |
| River Garden Farms                         | 387             | 1               | 2                | 389           |
| Sutter Mutual Water Company                | n/a             | n/a             | n/a              | n/a           |
| Sycamore Mutual Water Company              | 179             | <1              | 1                | 180           |
| T&P Farms                                  | 32              | <1              | <1               | 32            |
| Te Velde Revocable Family Trust            | 195             | <1              | 1                | 196           |
| <b>Total</b>                               | <b>14,175</b>   | <b>17</b>       | <b>40</b>        | <b>14,232</b> |

Note: Totals may not add up because of rounding.

Key:

CH<sub>4</sub> = methane; CO<sub>2</sub> = carbon dioxide; MTCO<sub>2</sub>e = metric tons carbon dioxide equivalent; N<sub>2</sub>O = nitrous oxide; n/a = not applicable (no groundwater substitution)

Emissions from groundwater substitution would be 14,232 metric tons CO<sub>2</sub>e per year (detailed calculations are provided in Appendix E). As a result, the Proposed Action would not conflict with any plan, policy, or regulation adopted for the purpose of reducing GHG emissions and impacts would be less than significant.

### VIII. HAZARDS AND HAZARDOUS MATERIALS

-- Would the project:

|                                                                                                                                                                                                                                  | Potentially<br>Significant<br>Impact | Less Than<br>Significant with<br>Mitigation<br>Incorporation | Less Than<br>Significant<br>Impact | No<br>Impact                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------------------------------|------------------------------------|-------------------------------------|
| a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?                                                                                          | <input type="checkbox"/>             | <input type="checkbox"/>                                     | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?                                  | <input type="checkbox"/>             | <input type="checkbox"/>                                     | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?                                                                  | <input type="checkbox"/>             | <input type="checkbox"/>                                     | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?   | <input type="checkbox"/>             | <input type="checkbox"/>                                     | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| e) Located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, result in a safety hazard for people residing or working in the project area? | <input type="checkbox"/>             | <input type="checkbox"/>                                     | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| f) Within the vicinity of a private airstrip, result in a safety hazard for people residing or working in the project area?                                                                                                      | <input type="checkbox"/>             | <input type="checkbox"/>                                     | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?                                                                                                        | <input type="checkbox"/>             | <input type="checkbox"/>                                     | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?             | <input type="checkbox"/>             | <input type="checkbox"/>                                     | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |

**a-h) No Impact.** The No Action Alternative and Proposed Action would not involve the transport or use of hazardous materials, nor change in any way public exposure to hazards or hazardous materials. The No Action Alternative and Proposed Action would not occur on a hazardous materials site that would create a risk to the public or environment. The No Action Alternative and Proposed Action would not affect a public airport or private air strip. There are no new structures or buildings included in the Proposed Action; therefore, no people or structures would be exposed to wildland fires as a result of implementation.

#### IX. HYDROLOGY AND WATER QUALITY

– Would the project:

|                                                                                                                                                                                                                                                                                                                                                                                               | Potentially<br>Significant<br>Impact | Less Than<br>Significant<br>with<br>Mitigation<br>Incorporation | Less Than<br>Significant<br>Impact  | No<br>Impact                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------|-------------------------------------|-------------------------------------|
| a) Violate any water quality standards or waste discharge requirements?                                                                                                                                                                                                                                                                                                                       | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)? | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?                                                                                                                                                            | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?                                                                                                                     | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?                                                                                                                                                                                                         | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

|                                                                                                                                                                      | Potentially<br>Significant<br>Impact | Less Than<br>Significant<br>with<br>Mitigation<br>Incorporation | Less Than<br>Significant<br>Impact  | No<br>Impact                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------|-------------------------------------|-------------------------------------|
| f) Otherwise substantially degrade water quality?                                                                                                                    | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map? | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?                                                                  | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?   | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| j) Inundation by seiche, tsunami, or mudflow?                                                                                                                        | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

#### a) Less than Significant

**No Action Alternative:** The No Action Alternative would not violate any waste discharge requirements as no changes to waste discharges to surface waters would occur. CVP and SWP operations in the Delta will be managed adaptively to meet water quality standards that are put in place throughout the water year. In December 2015, the State Water Resource Control Board approved an order that largely upholds the February 2015 Temporary Urgency Change Petition, but adds new provisions to ensure the CVP plans to maintain minimum reservoir storage levels in Shasta and Folsom reservoirs. The Order is intended to ensure that actions are taken to ensure that catastrophic fisheries declines do not continue, that salinity control is maintained in the Delta, and that adequate minimal supplies for health and safety purposes are preserved (SWRCB 2015).

**Proposed Action:** Under the Proposed Action, Reclamation would deliver the transferred water to TCCA Member Units on the same schedule that it would have delivered to the seller if no transfer occurred. This operation would result in a small change in flow between the TCCA diversion and the point where water would have been diverted without the transfer. The largest change in flow could be approximately 400 cfs in June (if the Sacramento River Settlement Contractors receive 100 percent of the Contract Total). For comparison, flows in the Sacramento River near Colusa averaged 6,315 cfs in June 2014 and 4,314 cfs in June 2015 (DWR 2015b). The transfers would not

affect flows downstream of the point where water would have been diverted if a transfer did not occur, therefore flows into the Delta would not be affected. Changes in flows would not violate any existing water quality standards or worsen any water quality and flow standard violation.

#### **b) Less than Significant**

**No Action Alternative:** It is too early in 2016 to know the quantity of available surface water supply. It is likely that multi-year dry conditions may limit the quantity of water delivered to CVP and SWP water service contractors. In the Sacramento Valley, supply reductions have historically resulted in increased groundwater pumping and decreased groundwater levels. However, groundwater levels have typically rebounded quickly after the dry periods (see Appendix C for historical groundwater monitoring data). The groundwater basin is likely to exhibit declining groundwater level trends similar to those that occurred during historic droughts (such as 1976-1977 and 1987-1992) caused by increased pumping to address reduced surface water supplies.

**Proposed Action:** Groundwater pumped in lieu of diverting surface water could affect groundwater hydrology. The potential effects could be short term declines in local groundwater levels, interaction with surface water, and land subsidence. Potential effects to water quality are discussed in Section (f) below.

Increased groundwater substitution pumping could result in temporary declines of groundwater levels. Groundwater substitution pumping could occur from April through October and the pumped groundwater would be used for crop irrigation within the seller's district. Declining groundwater levels resulting from increased groundwater substitution pumping could cause: (1) increased groundwater pumping costs due to increased pumping depth; (2) decreased yield from groundwater wells due to reduction in the saturated thickness of the aquifer; (3) decrease of the groundwater table to a level below the vegetative root zone, which could result in environmental effects; and 4) third-party impacts to neighboring wells.

Some of the transferred surface water would be delivered to users within the same groundwater basin, and could offset groundwater pumping in the Proposed Action to address shortages. The amount of offset is uncertain, so to be conservative, the analysis considers impacts to groundwater without this offset.

#### **Groundwater Levels**

**Redding Groundwater Basin.** Municipal, industrial, and agricultural water demands in the Redding Groundwater Basin area are approximately 8 million AF per year (DWR 2003). Groundwater is a major source of water supply within the Redding Groundwater Basin watershed. The exact quantity of groundwater that is pumped from the Redding Groundwater Basin is unknown;

however, it is estimated that approximately 50,000 AF of water is pumped annually from domestic, municipal, industrial, and agricultural production wells (CH2M Hill 2003 as cited in Anderson-Cottonwood ID 2011). This magnitude of pumping represents approximately six percent of the average annual runoff (850,000 AF) in the basin. Agricultural, industrial, and municipal groundwater users in the Redding Groundwater Basin pump primarily from deeper continental deposits; whereas, domestic groundwater users in the basin generally pump from shallower deposits (Anderson-Cottonwood ID 2011).

Some of the surface water made available for transfer through groundwater substitution transfers would originate from the Redding Groundwater Basin in Shasta County through Anderson-Cottonwood ID. The proposed Anderson-Cottonwood ID transfer would withdraw up to 4,800 AF per year of groundwater from production wells (see Table 3-8 for details on number of wells and pumping capacity). Unlike other groundwater substitution transfers, Anderson-Cottonwood ID's proposed transfer was not simulated in the Sacramento Valley Groundwater Model (SACFEM2013) because the model area does not include the Redding Groundwater Basin. However, Anderson-Cottonwood ID has tested operation of the wells proposed for groundwater substitution under the Proposed Action in the past at similar production rates and has observed no substantial impacts on groundwater levels or groundwater supplies (Anderson-Cottonwood ID 2013). Additionally, Anderson-Cottonwood ID used the same wells for groundwater substitution transfers in 2013 and 2014. Groundwater monitoring conducted in the vicinity of the production wells indicates groundwater levels recovered to pre-transfer levels soon after transfers occurred (Anderson-Cottonwood ID 2014, MBK Engineers 2015). Based on the results of the aquifer tests and monitoring data collected as part of 2013 transfers, groundwater substitution transfers are unlikely to have significant effects on groundwater levels. Because of the uncertainty of how groundwater levels could change, especially during a very dry year, Anderson-Cottonwood ID will implement the Monitoring Program and Mitigation Plan discussed below under Mitigation Measure GW-1.

***Sacramento Valley Groundwater Basin.*** Sacramento Valley and other parts of California are currently noticing declining groundwater level trends due to persistent dry weather conditions. However, past groundwater trends are indicative of groundwater levels declining moderately during extended droughts and recovering to pre-drought levels after subsequent wet periods (see Appendix C). DWR and other monitoring entities, as defined by Assembly Bill 1152, extensively monitor groundwater levels in the basin.

Groundwater drawdown impacts associated with the groundwater substitution pumping that would occur under the Proposed Action were evaluated using the SACFEM2013 groundwater model. The effects of concurrent groundwater substitution pumping from 151 wells that are part of the Proposed Action have been modeled to estimate effects to groundwater resources. The locations and

depths of these wells are specified in the model based on data collected from the potential groundwater substitution sellers.

- Figures 3-5, 3-6, 3-7, and 3-8 show the simulated drawdown due to the Proposed Action under September 1977 hydrologic conditions. During dry years, surface water resources are limited and users have historically increased groundwater pumping to address shortages. Water transfers for 2016 were simulated in SACS2013 using September 1977 hydrologic conditions because this year represents the driest condition available during the SACS2013 simulation period (Water Year [WY] 1970 to WY 2003). Simulating transfers during this period illustrates the potential to compound impacts from dry-year pumping as compared to the No Action Alternative. Figure 3-5 shows the simulated drawdown at the water table based on results from the top layer of the SACS2013 model. This layer has a depth of up to 35 feet below ground surface (bgs).
- Figure 3-6 shows simulated drawdown at approximately 200 to 300 feet bgs.
- Figure 3-7 presents the simulated drawdown at approximately 300 to 400 feet bgs.
- Figure 3-8 presents the simulated drawdown at approximately 700 to 900 feet bgs.

Drawdown at the water table (Figure 3-5) represents the estimated decline in the groundwater surface within the shallow, unconfined portion of the aquifer (i.e., the height of water within a shallow groundwater well). The drawdown in the deeper portions of the aquifer (Figures 3-6 through 3-8) represents a change in hydraulic head (i.e., water pressure) in a well that is screened in this deeper portion of the aquifer.

*This page intentionally left blank.*

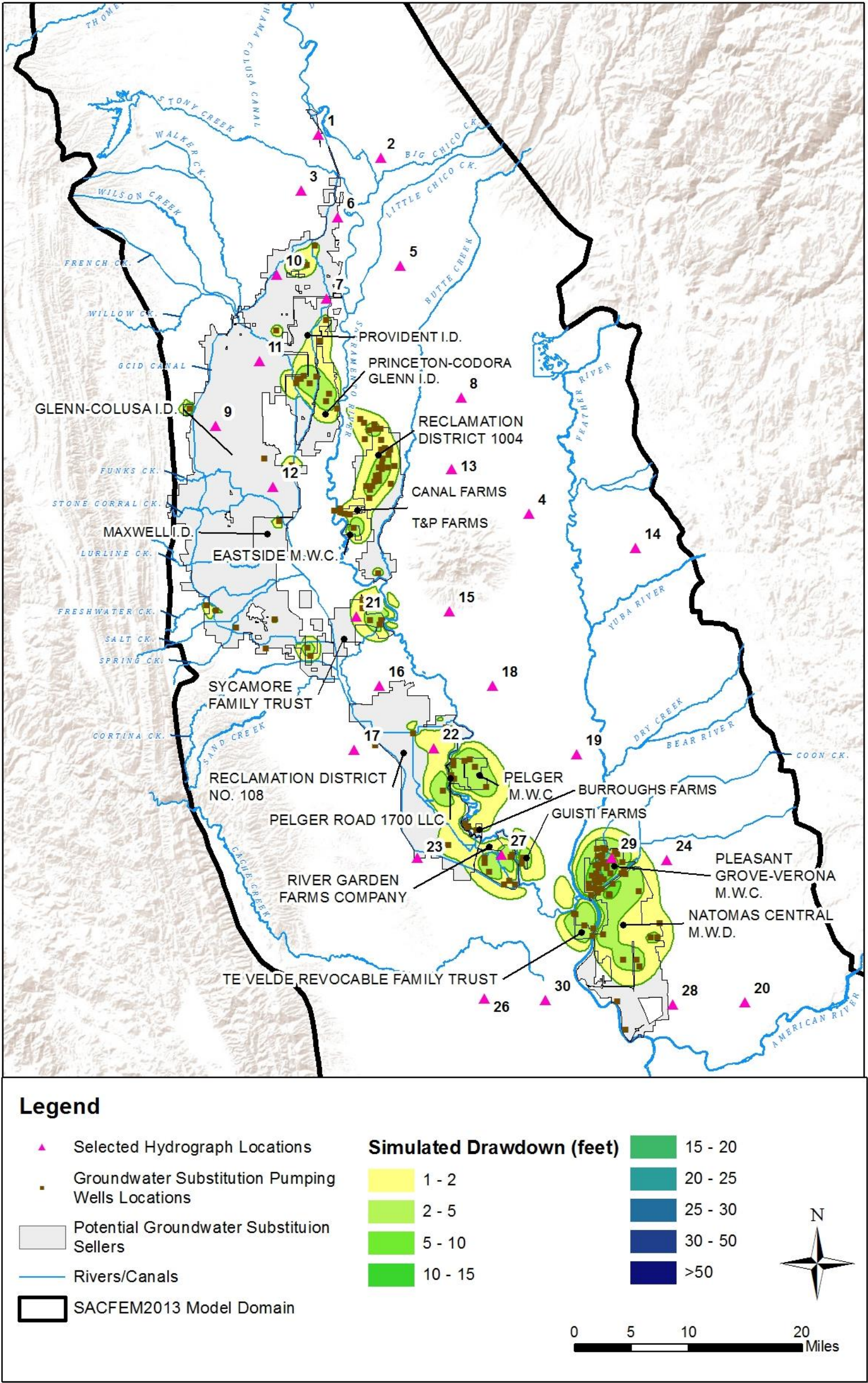


Figure 3-5. Simulated Change in Water Table Elevation (0 to approximately 35 feet bgs), Based on September 1977 Hydrologic Conditions

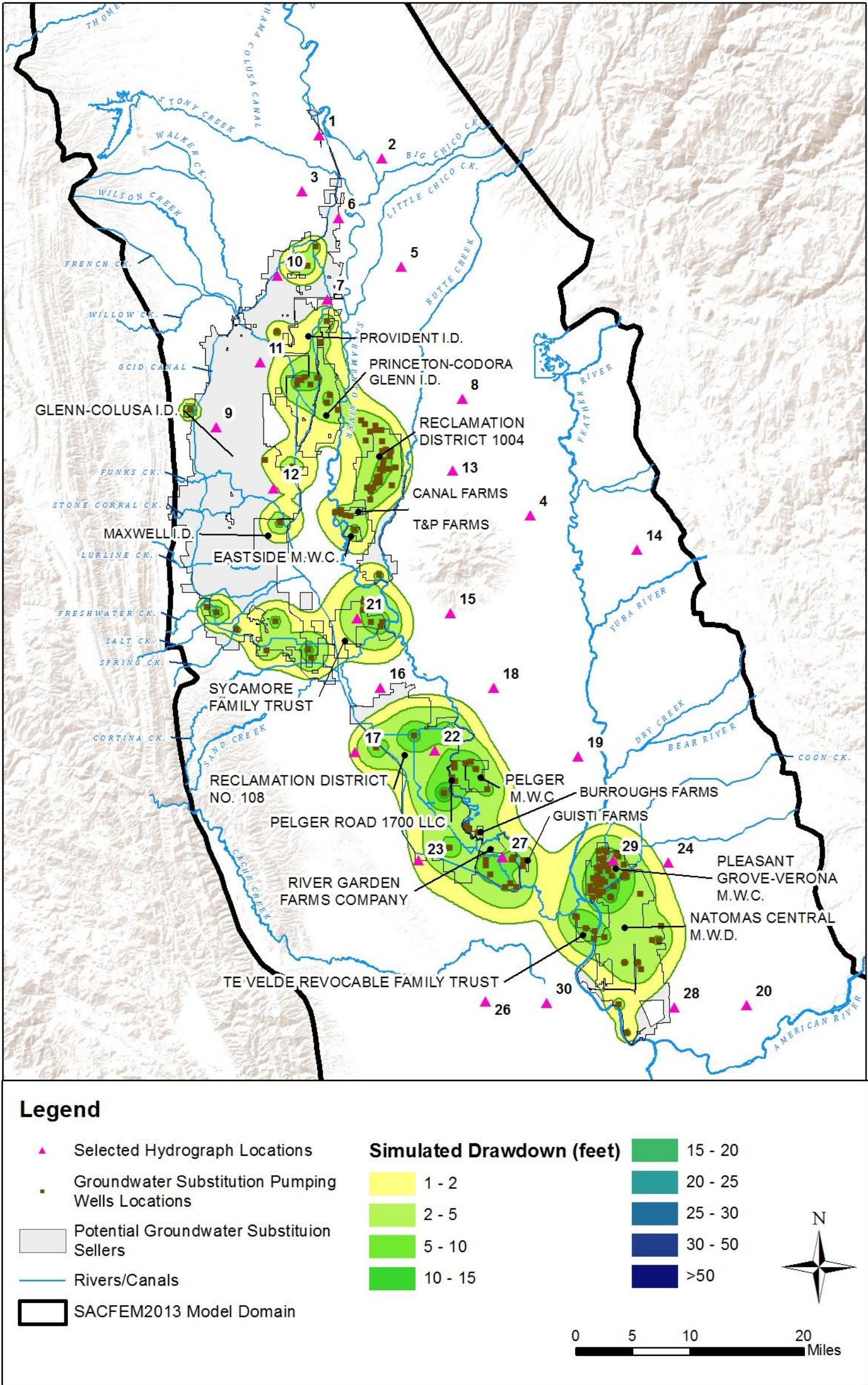


Figure 3-6. Simulated Change in Groundwater Head (approximately 200 to 300 feet bgs), Based on September 1977 Hydrologic Conditions

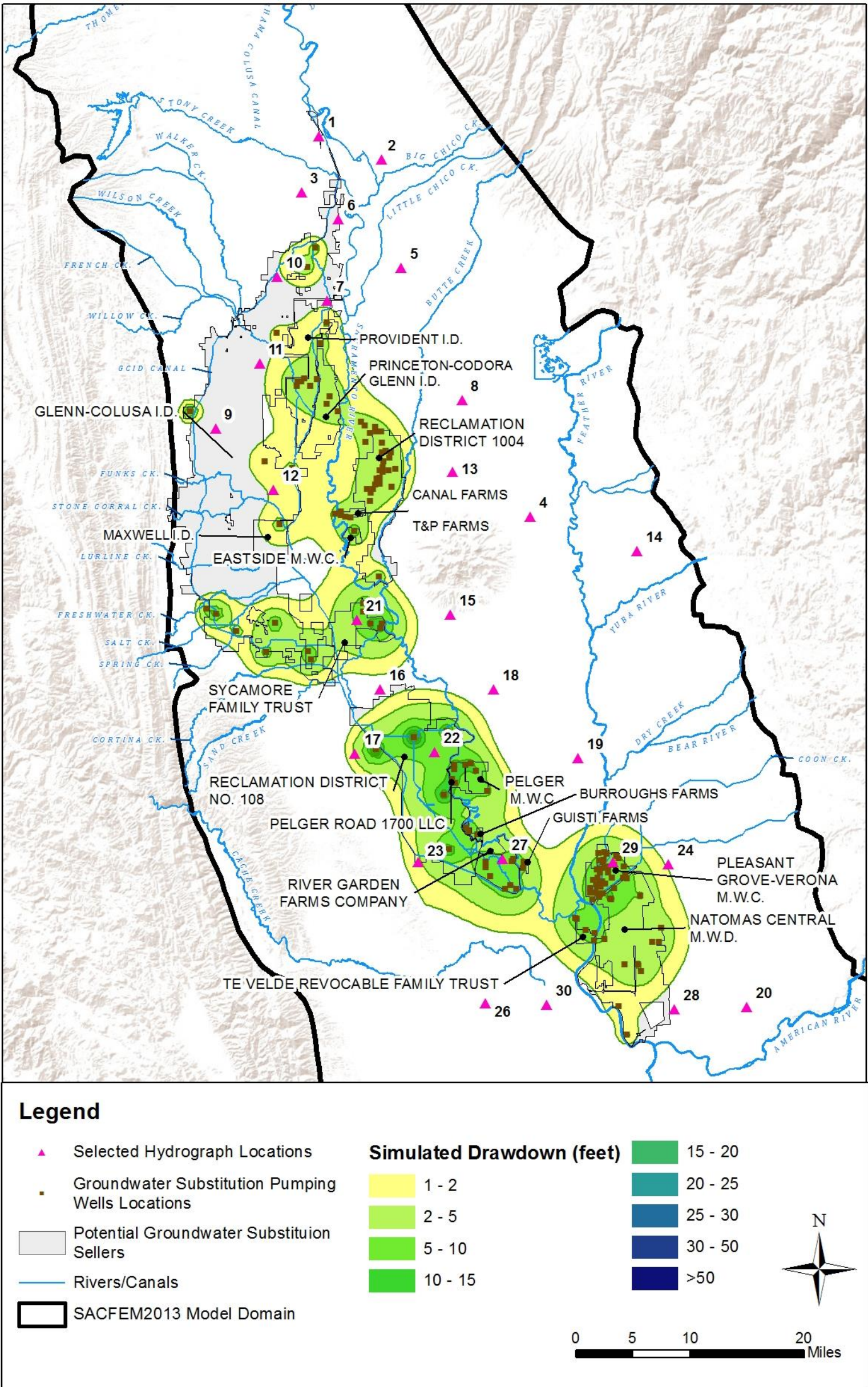


Figure 3-7. Simulated Change in Groundwater Head (approximately 300 to 400 feet bgs), Based on September 1977 Hydrologic Conditions

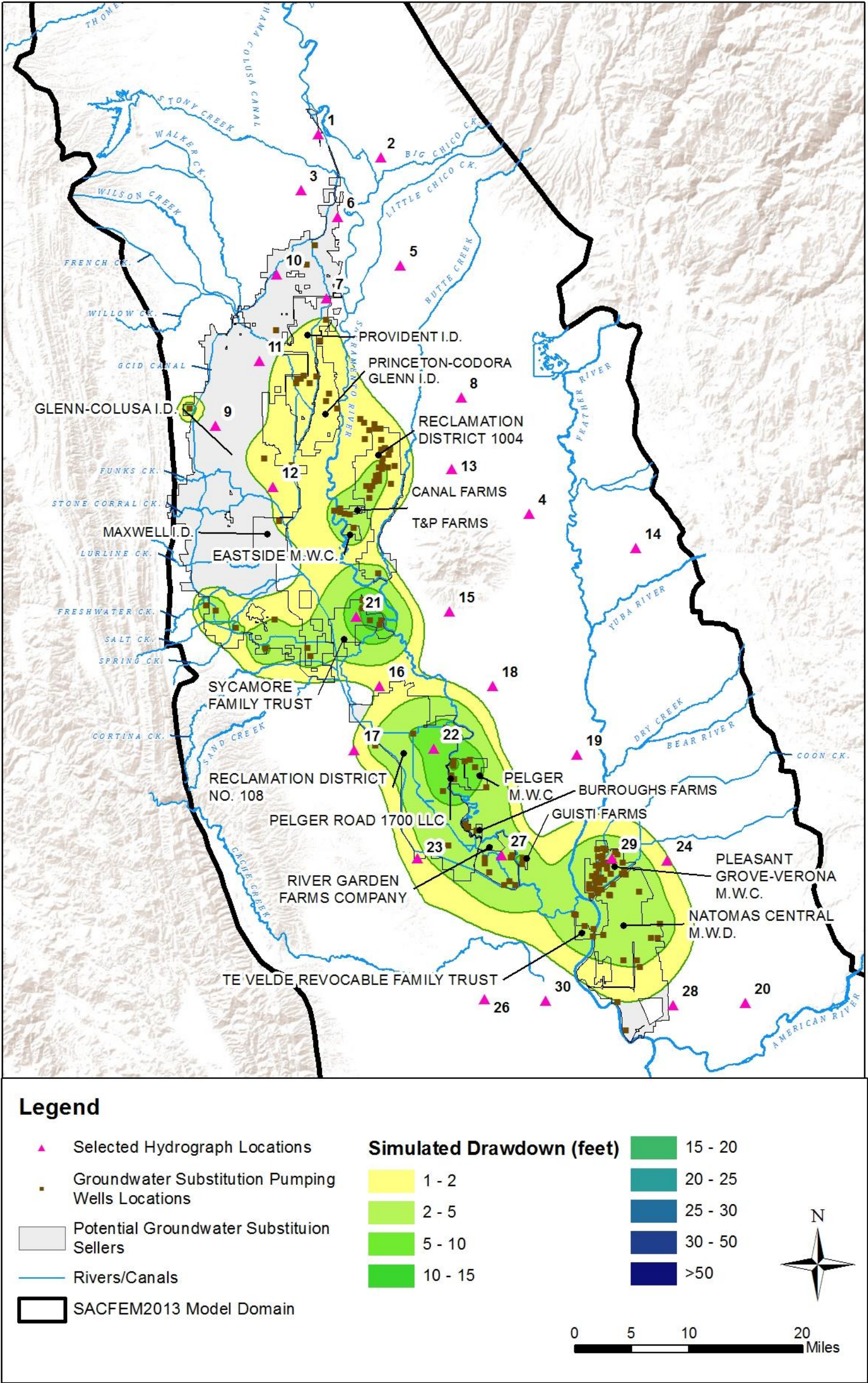


Figure 3-8. Simulated Change in Groundwater Head (approximately 700 to 900 feet bgs), Based on September 1977 Hydrologic Conditions

Figures 3-9 through 3-11 show simulated groundwater head hydrographs for Location 21 (see Figure 3-5 for location) for both the Baseline and Proposed Action. Figures 3-9 through 3-11 show that groundwater levels are lower under the Proposed Action (blue line) than under the No Action Alternative (red line). Figure 3-12 shows the change in groundwater level between the baseline and the Proposed Action at each level of the SACFEM2013 model (i.e., varying aquifer depths) near Sycamore MWC. Location 21 was selected because most areas in the model exhibit smaller drawdown changes than those shown in Location 21 (simulated drawdown shown in Figures 3-5 through 3-8). Approximately 60 percent of the pumping near Sycamore MWC (6,780 AF) was concentrated in aquifer model layers 5 and 6 (approximately 480 to 910 ft bgs). The pumping in aquifer layers 5 and 6 resulted in approximately 14 feet of drawdown due to the Proposed Action, as compared to Baseline conditions. Most of the recovery near the pumping zone occurs in the year following the transfer event. Recovery at the water table was more gradual. Groundwater recovery is highly dependent on (1) hydrology of the years following the transfer; (2) proximity of a transfer well to surface water; (3) pumping in the year following the transfer; and (4) aquifer properties. Appendix F, Groundwater Modeling Results, includes simulated groundwater head hydrographs for multiple locations shown in Figure 3-5.

Groundwater substitution under the Proposed Action could result in temporary drawdown that exceeds what would have occurred under the No Action Alternative. Model results show that increased groundwater pumping due to the Proposed Action could cause localized declines of groundwater levels, or cones of depression, that in some instances extend beyond the boundaries of the seller districts (Figures 3-5 through 3-8). Groundwater substitution transfers could result in groundwater declines in excess of seasonal variation and these effects on non-transferring wells could be significant. To reduce these effects, the Mitigation Measure GW-1 (below) specifies that transferring agencies establish monitoring and mitigation programs for groundwater substitution transfers. The requirements of GW-1 would require monitoring of groundwater levels within the local pumping area and if effects were reported or occurred, the participating seller agencies in the Sacramento Valley Groundwater basin would compensate for effects or reduce pumping until the groundwater basin recharges as specified in GW-1. Mitigation Measure GW-1 would reduce the impacts to less than significant.

**Table 3-8. Water Transfers through Groundwater Substitution under the Proposed Action**

| <b>Groundwater Basin</b> | <b>Potential Seller</b>                    | <b>Number of Wells</b> | <b>Pumping Rate (gpm)</b> | <b>Range of Screened Interval (feet)</b> |
|--------------------------|--------------------------------------------|------------------------|---------------------------|------------------------------------------|
| Redding Area             | Anderson Cottonwood Irrigation District    | 2                      | 1,000 - 5,500             | 150 - 455                                |
| Sacramento Valley        | Burroughs Farms                            | 3                      | 2,000 – 3,200             | 120 - 580                                |
|                          | Canal Farms                                | 3                      | 3,500 - 5,000             | 65 - 660                                 |
|                          | Eastside Mutual Water Company              | 1                      | 4,720                     | 150 - 240                                |
|                          | Guisti Farms                               | 2                      | 3,200                     | 150 - 400                                |
|                          | Glenn-Colusa Irrigation District           | 17                     | 800 – 4,300               | 25 –945                                  |
|                          | Maxwell Irrigation District                | 2                      | 3,800                     | 150 - 240                                |
|                          | Natomas Central Mutual Water Company       | 14                     | 1,000 - 2,500             | 10 - 952                                 |
|                          | Pelger Mutual Water Company                | 4                      | 1,500 - 5,000             | 101 - 485                                |
|                          | Pelger Road 1700 LLC                       | 2                      | 3,000 - 3,500             | 200 - 820                                |
|                          | Pleasant Grove-Verona Mutual Water Company | 35                     | 1,500 - 5,000             | 99 - 260                                 |
|                          | Princeton-Codora-Glenn Irrigation District | 4                      | 1,000 - 3,000             | 120 - 330                                |
|                          | Provident Irrigation District              | 7                      | Approximately 1,100       | 100 - 420                                |
|                          | Reclamation District 108                   | 5                      | 1,700 - 5,900             | 250 - 680                                |
|                          | Reclamation District 1004                  | 28                     | 1,000 - 5,800             | 56 - 430                                 |
|                          | River Garden Farms                         | 8                      | 1,700 - 3,000             | 170 - 686                                |
|                          | Sycamore Mutual Water Company              | 5                      | 3,200 - 6,500             | 160 - 906                                |
|                          | T&P Farms                                  | 2                      | 3,500 - 4,000             | 256 - 862                                |
|                          | Te Velde Revocable Family Trust            | 5                      | 2,200 - 4,700             | 115 - 455                                |

### **Groundwater/Surface Water Interaction**

The implementation of groundwater substitution pumping can lower the groundwater table and may change the relative difference between the groundwater and surface water levels. This change could reduce the amount of surface water, as compared to pre-pumping conditions, due to two mechanisms. The mechanisms are:

- Induced leakage. Lowering the groundwater table causes a condition where the groundwater table is lower than the surface water level. This condition causes leakage out of a surface water body and could also increase percolation rates on irrigated lands.
- Interception of groundwater. A pumping well used for groundwater substitution pumping can intercept groundwater that would have discharged to the surface water absent the pumping.

Because these mechanisms may result in a depletion of streamflow, the volume of water actually transferred is not the same as the volume of groundwater pumped through a substitution action. The amount of water that can justifiably be considered to be transferred is the volume of substitution pumping less the amount of induced leakage and the amount of intercepted groundwater flow. The Proposed Action includes measures that would reduce the amount of water that the TCCA receives by an estimated 13 percent depletion factor to prevent any adverse impacts associated with groundwater/surface water interaction, as further described in Chapter 2. This would mitigate potential stream depletion as a result of the Proposed Action. Additionally, the potential effects to fish and riparian vegetation from decreased streamflows are assessed in the Biological Resources section.

### **Land Subsidence**

Excessive groundwater extraction from unconfined and confined aquifers could lower groundwater levels and decrease pore-water pressure in the aquifer. The reduction in pore-water pressure could result in a loss of structural support within clay and silt beds in the aquifer. The loss of structural support could cause the compression of clay and silt beds resulting in a lowering of the ground surface elevation (land subsidence). The compression of fine-grained deposits, such as clay and silt, is largely permanent. Infrastructure damage and alteration of drainage patterns are possible consequences of land subsidence.

*Redding Groundwater Basin.* DWR and USGS have been involved in land subsidence monitoring efforts throughout California and data collected thus far in the Redding Groundwater Basin have not been indicative of any subsidence issues. Most of the Redding Groundwater Basin (except South Battle Creek and Redwood sub basins have insufficient data and Millville sub basin has been categorized under the low to medium potential for subsidence category) has been categorized as having low potential for land subsidence according to a DWR study published in August 2014 (DWR 2014b). The South Battle Creek

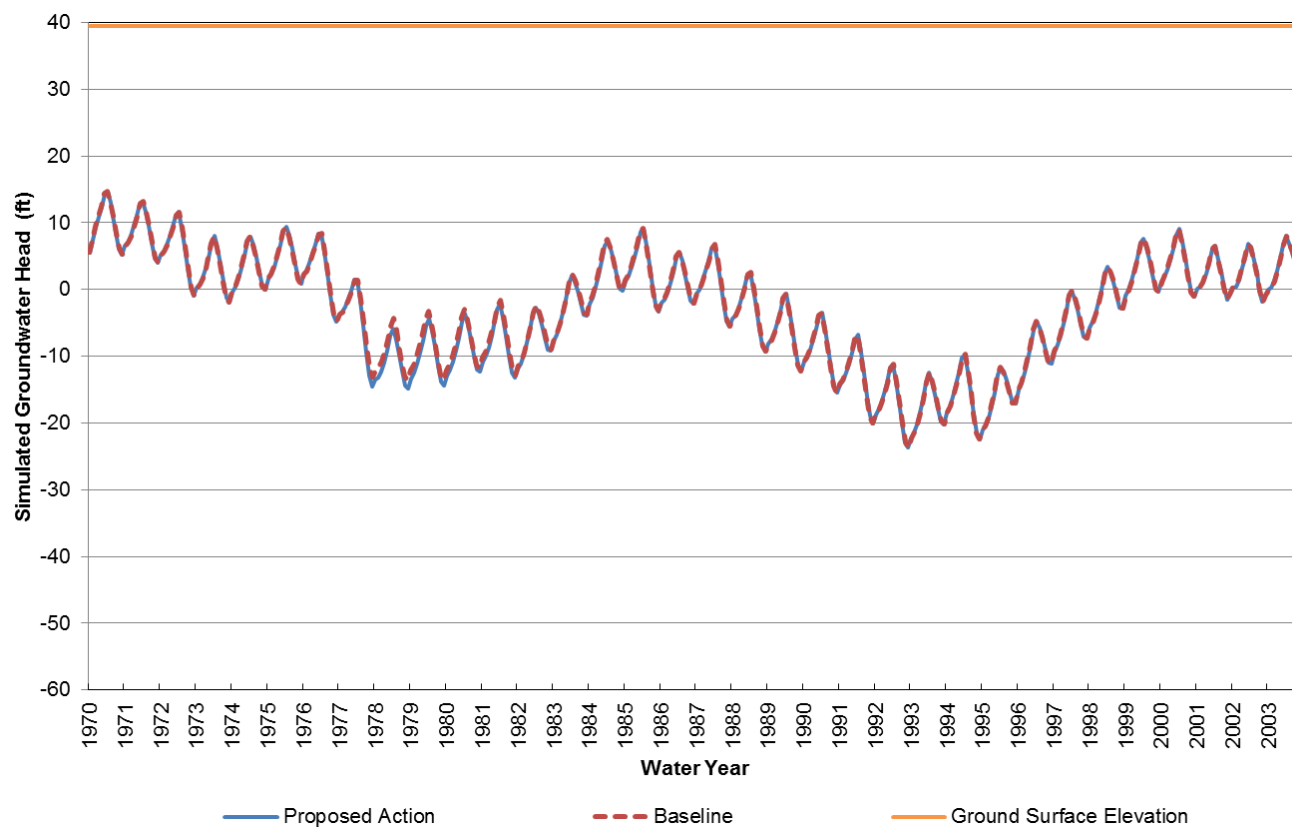
and Redwood sub basins have insufficient data for development and assessment. The Millville sub basin has been categorized under the low to medium potential for subsidence category

The portion of the Redding Groundwater Basin west of the Sacramento River is composed of the Tehama Formation. The Tehama Formation has exhibited subsidence in Yolo County. The Tehama formation in the Redding Groundwater Basin has similar hydrogeologic characteristics to that in the Yolo County area, and therefore, may be conducive to subsidence.

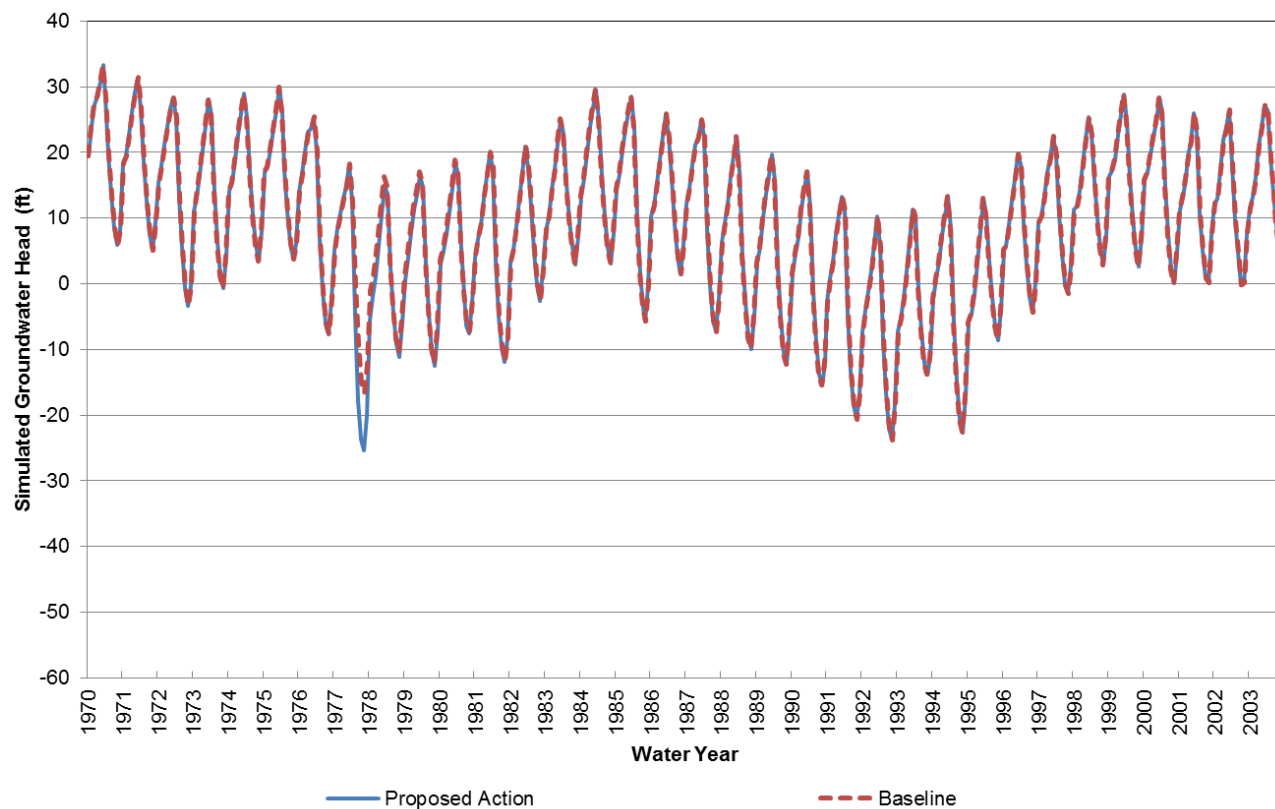
The potential for subsidence as a result of the Proposed Action is small if the groundwater substitution pumping is small compared to overall pumping in a region. While the potential for subsidence is small, Anderson-Cottonwood ID will implement the Monitoring Program and Mitigation Plan described below under Mitigation Measure GW-1, which includes subsidence monitoring. The subsidence monitoring will measure changes in the ground surface elevation, whether subsidence is short-term or long-term. The monitoring and mitigation actions would verify that this impact would be less than significant.

***Sacramento Valley Groundwater Basin.*** In the Sacramento Valley Groundwater Basin, portions of Colusa and Yolo counties have experienced subsidence. Historically, land subsidence occurred in the eastern portion of Yolo County and the southern portion of Colusa County because of groundwater pumping and the geology of the area. DWR's subsidence monitoring program within the Sacramento Valley Groundwater Basin includes 11 extensometer stations that are located in Yolo (2 extensometers), Sutter (1), Colusa (2), Butte (3), and Glenn (3) counties. Five of the 11 extensometers have shown evidence of recent subsidence. Within Conaway Ranch, extensometer 09N03E08C004M (in Yolo County) has recorded approximately 0.2 feet of subsidence from 2012 to 2013 and an additional 0.6 foot from 2013 to 2014 (DWR 2014a). In comparison, slightly less than 0.1 foot of subsidence occurred over the previous 22 years (1991 to 2012). The area between Zamora, Knights Landing, and Woodland has been most affected (Yolo County 2012). Subsidence in this region is generally related to groundwater pumping and subsequent consolidation of loose aquifer sediments. The Proposed Action does not include groundwater substitution transfers within Conaway Ranch. One of the extensometers in Glenn County has recorded approximately 0.05 feet of subsidence from 2005 to 2015 (DWR 2015a). DWR has categorized the Yolo and Colusa sub basins (groundwater basins underlying most of Glenn, Colusa and Yolo Counties) as having a high potential for land subsidence.

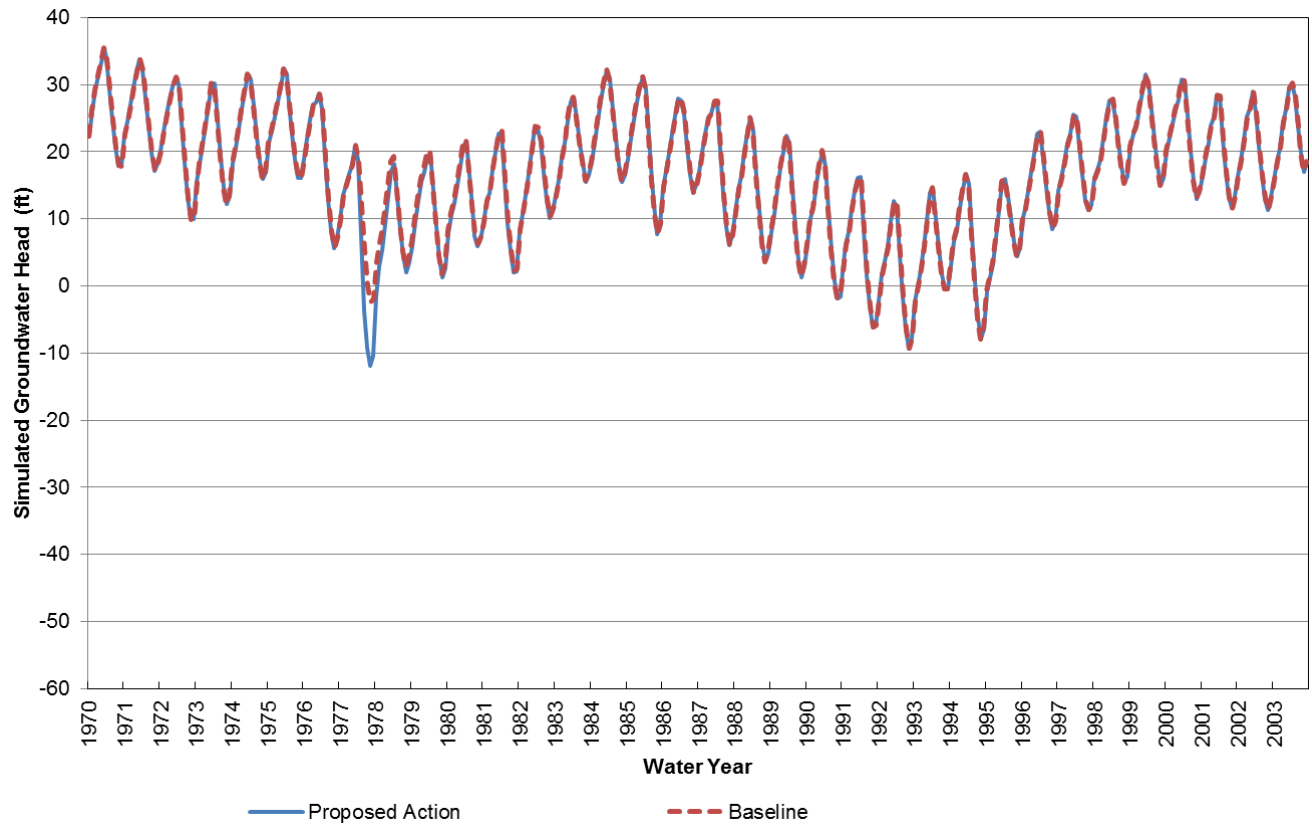
Groundwater substitution transfers within the Sacramento Valley Groundwater Basin could increase the potential for land subsidence to cause significant impacts when groundwater levels fall below historic low water level. Impacts would be reduced with Mitigation Measure GW-1. Therefore, the effect on potential land subsidence in the Sacramento Valley Groundwater Basin after mitigation would be less than significant.



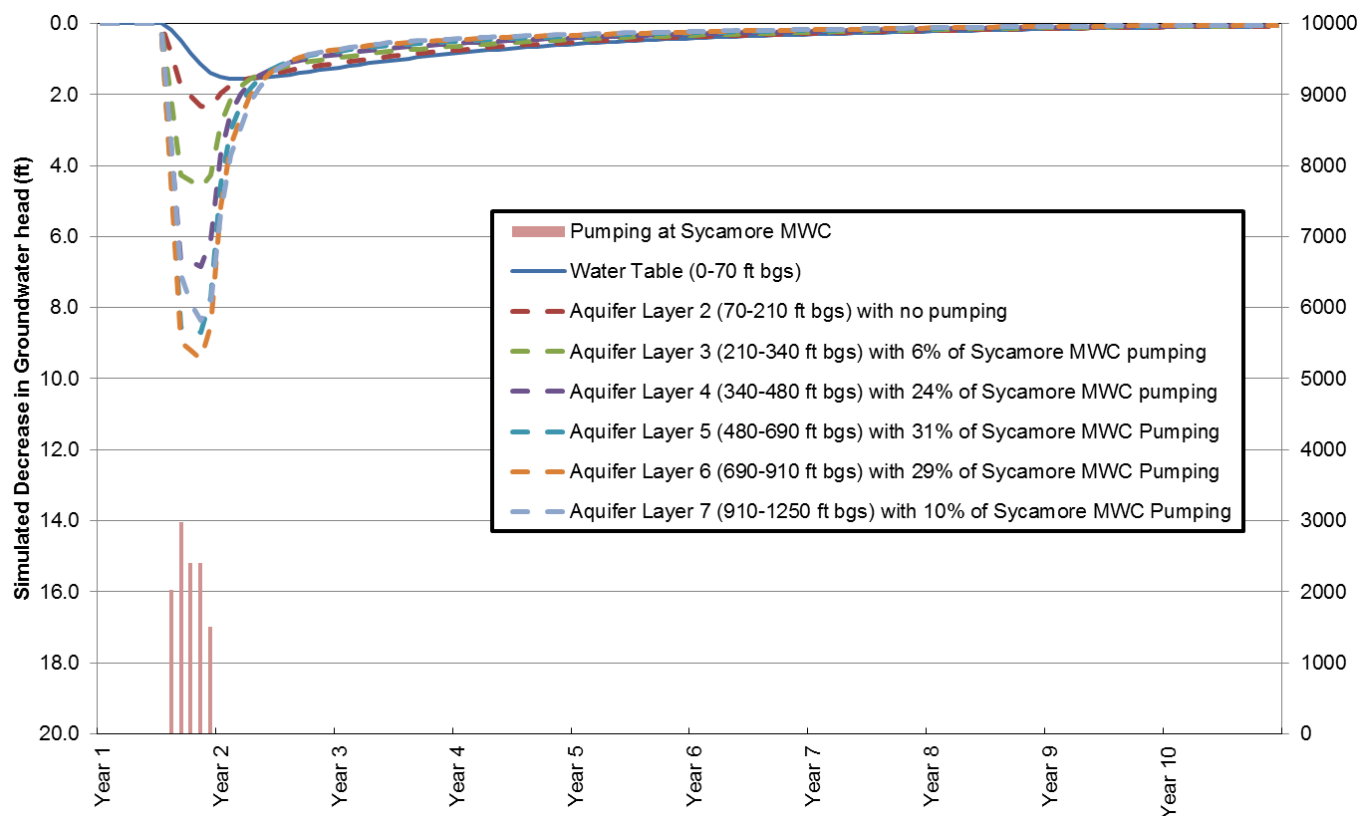
**Figure 3-9. Simulated Groundwater Table Elevation (0 to approximately 70 feet bgs) at Location 21 (See Figure 3-5 for Location)**



**Figure 3-10. Simulated Groundwater Head (approximately 480 to 690 feet bgs) at Location 21 (See Figure 3-5 for Location)**



**Figure 3-11. Simulated Groundwater Head (approximately 690 to 910 feet bgs) at Location 21 (See Figure 3-5 for Location)**



**Figure 3-12. Simulated Change in Groundwater Head at Location 21 (See Figure 3-5 for Location) under the Proposed Action**

#### **Mitigation Measure GW-1: Monitoring Program and Mitigation Plan**

The *DRAFT Technical Information for Preparing Water Transfer Proposals* (Reclamation and DWR 2015) provides guidance for the development of groundwater substitution water transfer proposals. The technical information informs the development of the monitoring and mitigation program for the range of potential transfer activities evaluated in this EA/IS.

The objective of Mitigation Measure GW-1 is to avoid significant adverse environmental effects and ensure prompt corrective action in the event unanticipated effects occur. The measure accomplishes this by monitoring groundwater and/or surface water levels during transfers to avoid potential effects. The objectives of this process are to: (1) minimize potential effects to other legal users of water; (2) provide a process for review and response to reported effects to non-transferring parties; (3) assure that a local mitigation strategy is in place prior to the groundwater transfer; and (4) mitigate significant adverse environmental effects. Reclamation will verify that sellers adopt and implement these mitigation measures to avoid potentially significant adverse effects of transfer-related groundwater extraction. In addition, each entity participating in a groundwater substitution transfer must confirm that the proposed groundwater pumping will be compatible with state and local

regulations and Groundwater Management Plans (GMPs). As Groundwater Sustainability Plans (GSPs) are developed by Groundwater Sustainability Agencies, potential sellers must confirm that the proposed pumping is compatible with applicable GSPs.

***Well Review Process***

Potential sellers must submit well data for Reclamation and, where appropriate, DWR review, as part of the transfer approval process. Required information will be detailed in the most current version of the *DRAFT Technical Information for Preparing Water Transfer Proposals*.

***Monitoring Program***

Potential sellers must complete and implement a monitoring program subject to Reclamation's approval that shall, at a minimum, include the following components:

- *Monitoring Well Network.* The monitoring program shall incorporate a sufficient number of monitoring wells, as determined by Reclamation and the sellers in relation to local conditions, to accurately characterize groundwater levels and response in the area before, during, and after transfer pumping takes place. Depending on local conditions, additional groundwater level monitoring may be required near ecological resource areas.
- *Groundwater Pumping Measurements.* All wells pumping to replace surface water designated for transfer shall be configured with a permanent instantaneous and totalizing flow meter capable of accurately measuring well discharge rates and volumes. Flow meter readings will be recorded just prior to initiation of pumping and at designated times, but no less than monthly and as close as practical to the last day of the month, throughout the duration of the transfer.
- *Groundwater Levels.* Sellers will collect measurements of groundwater levels in both participating transfer wells and monitoring wells. Groundwater level monitoring will include measurements before, during and after transfer-related pumping. The seller will measure groundwater levels as follows:
  - Prior to transfer: Groundwater levels will be measured monthly from March in the year of the proposed transfer-related pumping until the start of the transfer (where possible).
  - Start of transfer: Groundwater levels will be measured on the same day that the transfer-related pumping begins, prior to the pump being turned on.

- During transfer-related pumping: Groundwater levels will be measured weekly throughout the transfer-related pumping period, unless site specific information indicates a different interval should be used.
- Post-transfer pumping: Groundwater levels will be measured weekly for one month after the end of transfer-related pumping, after which groundwater levels will be measured monthly through March of the year following the transfer.

Sellers thus monitor effects to groundwater levels that may result from the proposed transfer and avoid significant impacts. The primary criteria used to identify potentially significant impacts to groundwater levels are the BMOs set by GMPs. In the Sacramento Valley, several counties have established GMPs to provide guidance in managing the resource.

In areas where quantitative BMOs do not exist, Reclamation, TCCA, and the potential seller(s) will coordinate closely with potentially impacted third parties to collect and monitor groundwater data. If a third party expects that it may be impacted by a proposed transfer, that party should contact Reclamation and the seller with its concern. The burden of collecting groundwater data will not be the responsibility of the third party. If warranted, groundwater level monitoring to address the third-party's concern may be incorporated in the monitoring and mitigation plans required by Mitigation Measure GW-1.

Additionally, to avoid significant effects to vegetation and allow sellers to modify actions before significant effects occur, sellers will monitor groundwater depth data to verify that significant adverse effects to deep-rooted vegetation are avoided. If monitoring data indicate that water levels have dropped below root zones (i.e., more than 10 feet where groundwater was 10 to 25 feet below ground surface prior to starting the transfer of surface water made available from groundwater substitution actions), the seller must implement actions set forth in the mitigation plan. If historic data show that groundwater elevations in the area of transfer have typically varied by more than this amount annually during the proposed transfer period, then the transfer may be allowed to proceed. If there is no deep-rooted vegetation (i.e., oak trees and riparian trees that would have tap roots greater than 10 feet deep) within one-half mile of the transfer wells or the vegetation is located along waterways that will continue to have water during the transfer, the transfer may be allowed to proceed. If no existing monitoring points exist in the shallow aquifer, monitoring would be based on visual observations of the health of these areas of deep-rooted vegetation. If significant adverse impacts to deep-rooted vegetation (that is, loss of a substantial percentage of the deep-rooted vegetation as determined by

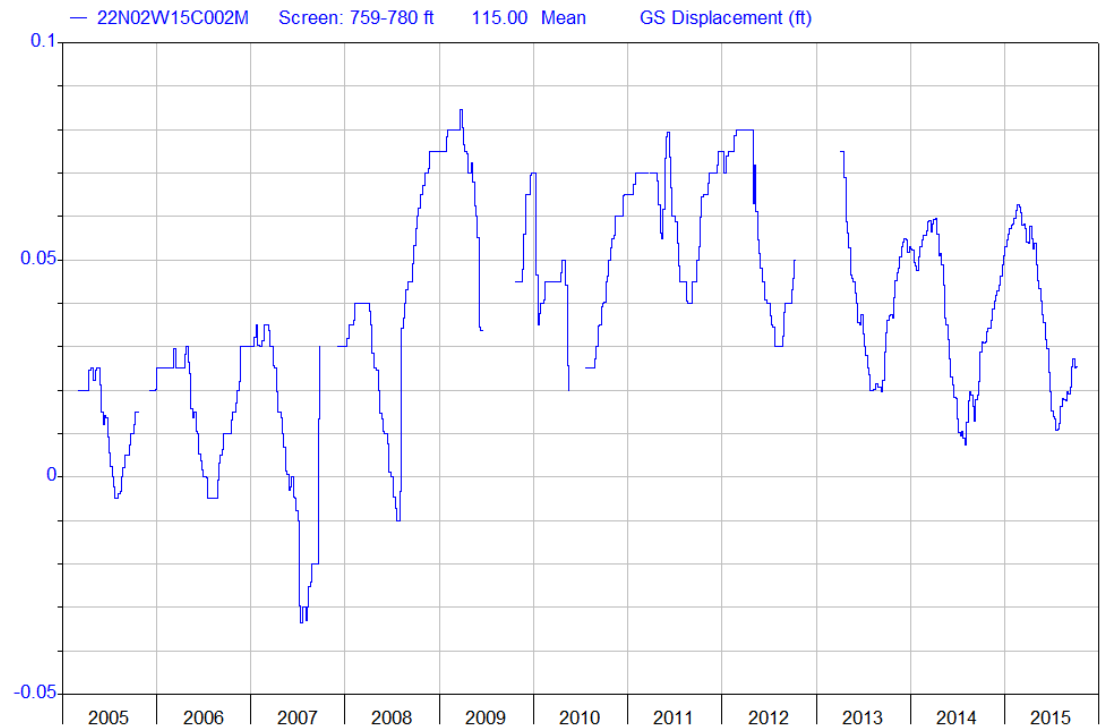
Reclamation based on site-specific circumstances in consultation with a qualified biologist) occur as a result of the transfer despite the monitoring efforts and implementation of the mitigation plan, the seller will prepare a report documenting the result of the restoration activity to plant, maintain, and monitor restoration of vegetation for 5 years to replace the losses.

- *Groundwater Quality.* For municipal sellers, the comprehensive water quality testing requirements of Title 22 are considered sufficient for the water transfer monitoring program. Agricultural sellers shall measure specific conductance in samples from each participating production well. Samples shall be collected when the seller first initiates pumping, monthly during the transfer period, and at the termination of transfer pumping.
- *Land Subsidence.* Subsidence monitoring will be required if groundwater levels could decline below historic low levels during the proposed water transfer. Before a transfer, each seller will examine local groundwater conditions and groundwater level changes based on past pumping events or groundwater substitution transfers. This existing information will be the basis to estimate if groundwater levels are likely to decline below historic low levels, which would trigger land surface elevation measurements (as described below).

If the measured groundwater level falls below the historic low level, the seller must confirm the measurement within seven days. If the water level has risen above the historic low level, the seller may continue transfer pumping. If the measured groundwater level remains below the historic low level, the seller will stop transfer-related pumping immediately or begin land surface elevation measurements in strategic locations within and/or near the transfer-related pumping area. Measurements may include (1) extensometer monitoring, (2) continuous GPS monitoring, or (3) extensive land-elevation benchmark surveys conducted by a licensed surveyor. This data could be collected by the seller or from other sources (such as public extensometer data). Measurements must be completed on a monthly basis during the transfer.

If the land surface elevation survey indicates an elevation decrease between 0.1 foot and 0.2 foot from the initial measurement, the seller could have significant impacts and would need to start the process identified below in the Mitigation Plan. The seller will also work with Reclamation to assess the accuracy of the survey measurements based on current limitations of technology, professional engineering/surveying judgment, and any other data available in or near the transferring area.

The threshold of 0.1 foot was chosen as this value is typical of the elastic (i.e., recoverable) portion of subsidence; the threshold of 0.2 foot was selected considering limitations of current land survey technology. This threshold is supported by a review of data from extensometers within the Sacramento Valley. Figure 3-13 shows the subsidence data from extensometer 22N02W15C002M, in Glenn County. This extensometer has not been identified as having long-term declining trends, but exhibits a small amount of movement (up to about 0.1 foot).



Source: DWR 2015c

**Figure 3-13. Measured Ground Surface Displacement (in feet) at Extensometer 22N02W15C002M in Glenn County**

- *Coordination Plan.* The monitoring program will include a plan to coordinate the collection and organization of monitoring data. This plan will describe how input from third parties will be incorporated into the monitoring program, and will include a plan for communication with Reclamation as well as other decision makers and third parties.
- *Evaluation and Reporting.* The proposed monitoring program will describe the method of reporting monitoring data. At a minimum, sellers will provide data summary tables to Reclamation, both during and after transfer-related groundwater pumping. Post-program reporting will continue through March of the year following the

transfer. Sellers will provide a final summary report to Reclamation evaluating the effects of the water transfer. The final report will identify transfer-related effects on groundwater and surface water (both during and after pumping), and the extent and significance, if any, of effects on local groundwater users. It shall include groundwater elevation contour maps for the area in which transfer operations are located, showing pre-transfer groundwater elevations, groundwater elevations at the end of the transfer, and recovered groundwater elevations in March of the year following the transfer. The summary report shall also identify the extent and significance, if any, of transfer-related effects to ecological resources such as fish, wildlife, and vegetation resources.

***Mitigation Plan***

Potential sellers must complete and implement a mitigation plan to avoid potentially significant groundwater impacts and ensure prompt corrective action in the event unanticipated effects occur. Mitigation actions could include:

- Curtailment of pumping until natural recharge corrects the issue.
- Lowering of pumping bowls in non-transferring wells affected by transfer pumping.
- Reimbursement for significant increases in pumping costs due to the additional groundwater pumping to support the transfer.
- Curtailment of pumping until water levels rise above historic lows if non-reversible subsidence is detected (based on local data to identify elastic versus inelastic subsidence).
- Reimbursement for modifications to infrastructure that may be affected by non-reversible subsidence.
- Other appropriate actions based on local conditions, as determined by Reclamation.

As summarized above, the purpose of Mitigation Measure GW-1 is to monitor groundwater levels during transfers to avoid potentially significant adverse effects. The mitigation plan will describe how to avoid significant effects and address any significant effects that occur despite the monitoring efforts. The objectives of this process are to: (1) minimize potential effects to other legal users of water; (2) provide a process for review and response to reported effects; and (3) assure that a local mitigation strategy is in place prior to the groundwater transfer. Accordingly, to ensure that mitigation plans will be feasible, effective, and tailored to local conditions, the plan must include the following elements:

- A procedure for the seller to receive reports of purported environmental effects or effects to non-transferring parties;
- A procedure for investigating any reported effect;
- Development of mitigation options, in cooperation with the affected parties, for legitimate significant effects; and
- Assurances that adequate financial resources are available to cover reasonably anticipated mitigation needs.

Mitigation to avoid potentially significant subsidence impacts and ensure prompt corrective action in the event that unanticipated effects occur is described by the following stages.

#### *Stage 1: Groundwater Levels*

Irreversible subsidence would not occur if groundwater levels stay above historic low levels for the entire transfer season. As groundwater is pumped from an aquifer, the pore water pressure in the aquifer is reduced. This reduction in pore water pressure increases the effective stress on the structure of the aquifer itself. This increase in effective stress can cause the aquifer structure to deform, or compress, resulting in the subsidence of the ground surface elevation. Subsidence can be irreversible if the reduced effective stress is lower than the historically low effective stress. Typically this would be the result of groundwater levels reaching levels lower than the historical low level.

Before a transfer, each seller will examine local groundwater conditions and groundwater level changes based on past pumping events or groundwater substitution transfers. This existing information will be the basis to estimate if groundwater levels are likely to decline below historic low levels as a result of the proposed transfer. If the pre-transfer assessment indicates that groundwater levels will stay above historic low levels, and this finding is confirmed by monitoring during the transfer-related pumping period, then no additional actions for subsidence monitoring or mitigation are necessary. Sellers would need to proceed to stage 2 for land surface elevation monitoring if the pre-transfer estimates indicate that groundwater levels are anticipated to decline below historic low levels. If monitoring during the transfer-related pumping period (confirmed by two measurements within seven days) indicates that groundwater levels have fallen below historic low levels, sellers must immediately stop pumping from transfer wells in the area that is affected or proceed to stage 2.

#### *Stage 2: Ground Surface Elevations*

Stage 2 includes monthly ground surface monitoring during transfer-related pumping if pumping could cause groundwater levels to fall below historic low levels, as described above in the Monitoring Plan. If ground surface elevations decrease between 0.1 and 0.2 foot, the seller will evaluate the accuracy of the

information based on the current limitations of technology, professional engineering/surveying judgment, and other local data. If the elevations decline more than 0.2 foot, this change could indicate inelastic subsidence, which would trigger a shift to Stage 3.

*Stage 3: Local Investigation*

If the threshold of 0.2 foot of ground surface elevation change is exceeded, the seller shall cease groundwater substitution pumping for the transfer until one of the following occurs: (1) groundwater levels recover above historic low groundwater levels; (2) seller completes a more detailed local investigation identifying hydrogeologic conditions that could potentially allow continued transfer-related pumping from a subset of wells (if the seller can provide evidence that this pumping is not expected to cause additional subsidence); or (3) seller completes an investigation of local infrastructure that could be affected by subsidence (such as water delivery infrastructure, water supply facilities, flood protection facilities, highways, etc.) indicating the local threshold of subsidence that could be experienced before these facilities would be adversely affected. Any option should also consider the effect of non-transfer pumping that may be causing subsidence.

*Stage 4: Mitigation*

If subsidence effects to local infrastructure occur despite monitoring efforts, then the sellers must work with the lead agencies to determine whether the measured subsidence may be caused by transfer-related pumping. Any significant adverse subsidence effects caused by transfer pumping activities must be addressed. A contingency plan must be developed in the event that a need for further corrective action is necessary. This contingency plan must be approved by Reclamation before transfer-related pumping could continue after Stage 3.

*Stage 5: Continued Monitoring*

The sellers will continue to monitor for subsidence while groundwater levels remain below historic low levels. If the seller has ceased transfer-related pumping but groundwater levels remain below historic lows, subsidence monitoring will need to continue until the spring following the transfer. The results of subsidence monitoring will be factored into monitoring and mitigation plans for future transfers.

**c) Less than Significant**

**No Action Alternative:** Under normal farming practices, growers leave fields fallow during some cropping cycles in order to make improvements such as land leveling and weed abatement or to reduce pest problems and build soils. Growers manage potential soil erosion impacts to avoid substantial loss of soils and to protect soil quality (USDA NRCS 2009c). While growers would not be able to engage in management practices that result in a consumptive use of water on an idled field, they could continue such erosion control techniques as

surface roughening tillage to produce clods, ridges, and depressions to reduce wind velocity and trap drifting soil; establishment of barriers at intervals perpendicular to wind direction; or, application of mulch (USDA NRCS 2009c). Therefore, cropland idling under the No Action Alternative would not result in substantial soil erosion or sediment deposition into waterways. Impacts to water quality would be less than significant.

**Proposed Action:** The Proposed Action could include cropland idling in addition to the idling that would occur under the No Action Alternative, which has the potential to increase sediment erosion into nearby waterways. Similar to the No Action Alternative, growers would implement measures to prevent the loss of topsoil. Additionally, the rice crop cycle and the soil textures in the sellers' areas reduce the potential for wind erosion in this region. The process of rice cultivation includes incorporating the leftover rice straw into the soils after harvest through discing. Once dried, the combination of decomposed straw and clay texture soils typically produces a hard, crust-like surface. If left undisturbed, this surface texture would remain intact throughout the summer, when wind erosion would be expected to occur, until winter rains begin. This surface type would not be conducive to soil loss from wind erosion. During the winter rains, the hard, crust-like surface typically remains intact and the amount of sediment transported through winter runoff would not be expected to increase. Therefore, there would be little-to-no increase in sediment transport resulting from wind erosion or winter runoff from idled rice fields under the Proposed Action and the resultant impact would be less than significant.

**d, e, g, h, i, j) No Impact.** The Proposed Action and No Action Alternative would not involve any actions that would result in flooding or create runoff water that would exceed the capacity of existing drainage systems or provide a substantial source of polluted runoff.

**f) Less Than Significant.** Changes in groundwater levels and the potential change in groundwater flow directions could cause a change in groundwater quality through a number of mechanisms. One mechanism is the potential mobilization of areas of poorer quality water, drawn down from shallow zones, or drawn up into previously unaffected areas. Changes in groundwater gradients and flow directions could also cause (or speed) the lateral migration of poorer quality water.

**No Action Alternative:** Surface water shortages would likely cause some water users to pump additional groundwater. The groundwater pumping could cause water quality concerns, as described above. However, the groundwater pumping would follow historic dry year trends and would not likely change groundwater quality compared to existing conditions.

**Proposed Action:**

**Redding Groundwater Basin.** Groundwater in the Redding Groundwater Basin area of analysis is typically of good quality, as evidenced by its low TDS concentrations, which range from 70 to 360 mg/L. Areas of high salinity (poor water quality), are generally found on the western basin margins, where the groundwater is derived from marine sedimentary rock. Elevated levels of iron, manganese, nitrate, and high TDS have been detected in some areas (DWR 2003).

Groundwater extraction under the Proposed Action would be limited to withdrawals during the irrigation season of the 2016 contract year. Since groundwater in the Redding area is of good quality, adverse effects from the migration of reduced groundwater quality would be anticipated to be minimal.

**Sacramento Valley Groundwater Basin.** Groundwater quality in the Sacramento Valley Groundwater Basin is generally good and sufficient for municipal, agricultural, domestic, and industrial uses. However, there are some localized groundwater quality issues in the basin. Arsenic was detected above the maximum contaminant level (MCL) in 22 percent of the primary aquifers within the Sacramento Valley. Nutrient concentration within the central Sacramento Valley region was above the MCLs in about three percent of the primary aquifers. In the southern portion of the basin, nutrients were detected above the MCLs in about one percent of the primary aquifers (Bennett et al. 2011).

Groundwater extraction under the Proposed Action would be limited to withdrawals during the irrigation season of the 2016 contract year. Groundwater extraction under the Proposed Action would be limited to short-term withdrawals during the irrigation season and extraction near areas of reduced groundwater quality would not be expected to result in a permanent change to groundwater quality conditions. Consequently, effects from the migration of reduced groundwater quality would be less than significant.

**X. LAND USE AND PLANNING -**

Would the project:

|                                                                                                                                                                                            | Potentially<br>Significant<br>Impact | Less Than<br>Significant<br>with Mitigation<br>Incorporation | Less Than<br>Significant<br>Impact | No<br>Impact                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------------------------------|------------------------------------|-------------------------------------|
| a) Physically divide an established community?                                                                                                                                             | <input type="checkbox"/>             | <input type="checkbox"/>                                     | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local | <input type="checkbox"/>             | <input type="checkbox"/>                                     | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |

#### X. LAND USE AND PLANNING -

Would the project:

|                                                                                                                  | Potentially<br>Significant<br>Impact | Less Than<br>Significant<br>with Mitigation<br>Incorporation | Less Than<br>Significant<br>Impact  | No<br>Impact             |
|------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------------------------------|-------------------------------------|--------------------------|
| coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect? |                                      |                                                              |                                     |                          |
| c) Conflict with any applicable habitat conservation plan or natural community conservation plan?                | <input type="checkbox"/>             | <input type="checkbox"/>                                     | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

**a, b) No Impact.** The No Action Alternative and Proposed Action would not involve any construction or new structures that could divide a community or conflict with land use plans, policies, or zoning.

**c) Less than Significant Impact.** The No Action Alternative and Proposed Action would not conflict with local policies protecting biological resources or habitat conservation plans. Section IV, Biological Resources, discusses effects to HCPs and NCCPs in the project area.

#### XI. MINERAL RESOURCES – Would the project:

|                                                                                                                                                                       | Potentially<br>Significant<br>Impact | Less Than<br>Significant<br>with<br>Mitigation<br>Incorporation | Less Than<br>Significant<br>Impact | No<br>Impact                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------|------------------------------------|-------------------------------------|
| a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?                                | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan? | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |

**a, b) No Impact.** The No Action Alternative and Proposed Action do not require construction or other activities that would result in the loss of availability of known mineral resources.

**XII. NOISE** - Would the project result in:

|                                                                                                                                                                                                                                     | Potentially<br>Significant<br>Impact | Less Than<br>Significant<br>with<br>Mitigation<br>Incorporation | Less Than<br>Significant<br>Impact  | No<br>Impact                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------|-------------------------------------|-------------------------------------|
| a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?                                                 | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?                                                                                                                             | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?                                                                                                      | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?                                                                                          | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| e) Located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels? | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| f) Within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels?                                                                                                      | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

**a, b, c, e, f) No Impact.** The No Action Alternative and Proposed Action would not result in the development of any new noise-emitting devices. The Proposed Action would only rely on existing facilities and equipment. No new construction activities would be associated with the Proposed Action and no ground-disturbing actions with the potential to generate groundborne vibrations would occur. Certain wells may be located within an airport land use plan, but there would be no new permanent residents or workers near the wells that could be affected by any plane noise. For private airstrips, the Proposed Action would not expose people in the vicinity to excessive noise levels.

**d) Less Than Significant.** The No Action Alternative would not increase ambient noise levels. The Proposed Action would result in the temporary operation of existing electric, diesel, and propane driven wells that would result in temporary increases in noise levels. All the wells would be located in rural

areas, which are generally removed from noise-sensitive receptors or in a farm setting with typical noise from agricultural operations. The wells would be operated by a willing landowner; therefore, any localized noise levels would be approved by the landowner. Noise impacts from increased well operation would be less than significant.

### XIII. POPULATION AND HOUSING

– Would the project:

|                                                                                                                                                                                                           | Potentially<br>Significant<br>Impact | Less Than<br>Significant with<br>Mitigation<br>Incorporation | Less Than<br>Significant<br>Impact | No<br>Impact                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------------------------------|------------------------------------|-------------------------------------|
| a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? | <input type="checkbox"/>             | <input type="checkbox"/>                                     | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?                                                                                     | <input type="checkbox"/>             | <input type="checkbox"/>                                     | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?                                                                                               | <input type="checkbox"/>             | <input type="checkbox"/>                                     | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |

**a) No Impact.** The No Action Alternative and Proposed Action would not induce population growth. Water transfers would help reduce water shortages, and would not increase the maximum acreage under production or require more farm workers to meet labor demands. No housing would be constructed, demolished, or replaced as a result of water transfers.

**b, c) No Impact.** The No Action Alternative and Proposed Action would include no construction, demolition, or other activities that could displace existing housing or people and necessitate the construction of replacement housing.

#### XIV. PUBLIC SERVICES

– Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

|                                                        | Potentially<br>Significant<br>Impact | Less Than<br>Significant<br>with<br>Mitigation<br>Incorporation | Less Than<br>Significant<br>Impact | No<br>Impact                        |
|--------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------|------------------------------------|-------------------------------------|
| a) Fire protection?                                    | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| b) Police protection?                                  | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| c) Schools?                                            | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| d) Parks?                                              | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| e) Other governmental facilities<br>(including roads)? | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |

**a-e) No Impact.** The No Action Alternative and Proposed Action would not create any new demand for public services or require any existing public facilities to be altered. Transferred water would be transported using existing conveyance facilities and pumping stations, and would not require the use of area roads, so there would be no impact to roads or other government facilities. Water transfers would not affect the supplies available to municipalities or other jurisdictions for fire protection, parks, or school use. Therefore, there would be no impact to public services or public facilities as a result of this project.

#### XV. RECREATION –

|                                                                                                                                                                                                                | Potentially<br>Significant<br>Impact | Less Than<br>Significant<br>with<br>Mitigation<br>Incorporation | Less Than<br>Significant<br>Impact | No<br>Impact                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------|------------------------------------|-------------------------------------|
| a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?                        | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |

**a, b) No Impact.** The No Action Alternative and Proposed Action would not affect any recreation facilities or require construction or expansion of recreation facilities.

**XVI. TRANSPORTATION/TRAFFIC –**  
Would the project:

|                                                                                                                                                                                                                                                                                                                                                                                                                                       | Potentially<br>Significant<br>Impact | Less Than<br>Significant<br>with<br>Mitigation<br>Incorporation | Less Than<br>Significant<br>Impact | No<br>Impact                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------|------------------------------------|-------------------------------------|
| a) Cause a conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit? | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?                                                                                                                                                                        | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?                                                                                                                                                                                                                                                                       | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?                                                                                                                                                                                                                                                                                | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| e) Result in inadequate emergency access?                                                                                                                                                                                                                                                                                                                                                                                             | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?                                                                                                                                                                                                                                                | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |

**a-g) No Impact.** The No Action Alternative and Proposed Action would not create any new demand on transportation services. The Proposed Action has no construction activities that would increase the traffic on roads in the project

area. The amount of water transferred would be less than what is supplied during normal water years, and so would not create an increase in farm activity in the buyer's area that could increase traffic. There would be no impact to the level of service or air traffic patterns in the project area, nor would there be an increase to the hazard to design features, inadequate emergency access or parking capacity, or conflict with adopted policies supporting alternative transportation.

**XVII. UTILITIES AND SERVICE SYSTEMS** - Would the project:

|                                                                                                                                                                                                                                   | Potentially<br>Significant<br>Impact | Less Than<br>Significant<br>with<br>Mitigation<br>Incorporation | Less Than<br>Significant<br>Impact | No<br>Impact                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------|------------------------------------|-------------------------------------|
| a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?                                                                                                                               | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?                            | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?                                      | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?                                                                            | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments? | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?                                                                                                            | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| g) Comply with federal, state, and local statutes and regulations related to solid waste?                                                                                                                                         | <input type="checkbox"/>             | <input type="checkbox"/>                                        | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |

**a-g) No Impact.** The No Action Alternative and Proposed Action would not create any new demand on utilities or service systems. There would be no impact to utility or service systems resulting from implementing the Proposed Action. Transfers would not require the construction of new water or wastewater treatment facilities as all water transfers would be done using existing facilities. There would be no increase in demand for wastewater treatment facilities that could exceed existing capacities, and no new storm water drainage facilities would be required under the Proposed Action.

Water transfers would be done within the existing entitlements and resources, and no new water supplies for the sellers would be required. Buyers would also not require new water supplies as the transfers would provide agricultural water in lieu of the limited surface water supplies.

There would be no solid waste generated as a result of the Proposed Action, and therefore no landfill would be required. Therefore, there would be no impact to utilities or other service systems as a result of the Proposed Action.

#### **XVIII. MANDATORY FINDINGS OF SIGNIFICANCE –**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Potentially<br/>Significant<br/>Impact</b> | <b>Less Than<br/>Significant<br/>with<br/>Mitigation<br/>Incorporation</b> | <b>Less Than<br/>Significant<br/>Impact</b> | <b>No<br/>Impact</b>                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|----------------------------------------------------------------------------|---------------------------------------------|-------------------------------------|
| a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory? | <input type="checkbox"/>                      | <input type="checkbox"/>                                                   | <input checked="" type="checkbox"/>         | <input type="checkbox"/>            |
| b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?                                                                                                           | <input type="checkbox"/>                      | <input type="checkbox"/>                                                   | <input checked="" type="checkbox"/>         | <input type="checkbox"/>            |
| c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either                                                                                                                                                                                                                                                                                                                                      | <input type="checkbox"/>                      | <input type="checkbox"/>                                                   | <input type="checkbox"/>                    | <input checked="" type="checkbox"/> |

XVIII. MANDATORY FINDINGS OF  
SIGNIFICANCE –

|                         | Potentially<br>Significant<br>Impact | Less Than<br>Significant<br>with<br>Mitigation<br>Incorporation | Less Than<br>Significant<br>Impact | No<br>Impact |
|-------------------------|--------------------------------------|-----------------------------------------------------------------|------------------------------------|--------------|
| directly or indirectly? |                                      |                                                                 |                                    |              |

**a) Less than Significant.** Water transfers would not have substantial incremental effects to habitat or species relative to the conditions that would occur in response to the dry hydrologic conditions. Environmental Commitments required for 2016 transfers would reduce potential special status species impacts to less than significant. Water transfers would not degrade the quality of the environment or eliminate examples of California history or prehistory.

**b) Less than Significant.** This cumulative impacts analysis identifies past, present and reasonably foreseeable future projects with the potential to contribute to cumulative effects, when combined with the Proposed Action. Information used in this cumulative impacts analysis is based on the best information available at this time.

Water transfers occur in many dry years to move water to agencies that may be experiencing shortages. The cumulative analysis considers other potential water transfers that could occur in the 2016 transfer season, including other CVP water transfers, non-CVP water transfers, and additional water transfers. Table 3-7 lists potential sellers, including those in the Proposed Action, that have indicated interest or have provided water for transfer in the past, including:

- Potential sellers in the Sacramento River, American River, Yuba River, and north-westerly Delta areas. The majority of these potential sellers, which include the sellers in the Proposed Action, were evaluated in the Long-Term Water Transfers EIR/EIS prepared by SLDMWA and Reclamation that analyzed potential CVP-related transfers from 2015 to 2024. Additional sellers in the Sacramento River area not evaluated in the EIS/EIR have indicated interest in selling water in 2016 and are also included in Table 3-7.
- Potential sellers in the Feather River Region from entities holding settlement agreements with DWR that could make surface water available for CVP or SWP contractors. These transfers would be approved and facilitated by DWR.

Water transfer methods could include cropland idling and groundwater substitution (the same as described for the Proposed Action). Transfer methods could also include additional methods such as conservation, where a seller takes

a conservation action to reduce irrecoverable water losses, and stored reservoir water, which includes releases of water that would have remained in storage in non-CVP or SWP reservoirs.

Transfer water shown in Table 3-9 could be sold to multiple agencies, including, TCCA, EBMUD, SWP contractors receiving water from the North Bay Aqueduct, and south of Delta buyers, including SLDMWA and Metropolitan Water District of Southern California. Unlike transfers to TCCA and EBMUD that would be diverted off the Sacramento River, transfers to south of Delta buyers would be exported through the Delta via Banks or Jones Pumping Plants.

**Table 3-9. Potential Cumulative Sellers (Upper Limits)**

| <b>Water Agency</b>                         | <b>Groundwater Substitution<sup>1</sup><br/>(acre-feet)</b> | <b>Cropland Idling/ Crop Shifting<sup>1</sup><br/>(acre-feet)</b> | <b>Stored Reservoir Release<sup>1</sup><br/>(acre-feet)</b> | <b>Conservation<sup>1</sup><br/>(acre-feet)</b> | <b>Maximum Potential Transfer<br/>(acre-feet per year)</b> |
|---------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------|------------------------------------------------------------|
| <b>Sacramento River Area</b>                |                                                             |                                                                   |                                                             |                                                 |                                                            |
| Anderson-Cottonwood Irrigation District     | 5,225                                                       |                                                                   |                                                             |                                                 | 5,225                                                      |
| Burroughs Farms                             | 2,000                                                       |                                                                   |                                                             |                                                 | 2,000                                                      |
| Canal Farms                                 | 1,000                                                       | 635                                                               |                                                             |                                                 | 1,635                                                      |
| Conaway Preservation Group                  | 35,000                                                      | 21,349                                                            |                                                             |                                                 | 35,000                                                     |
| Cranmore Farms (Pelger Road 1700 LLC)       | 8,000                                                       | 2,500                                                             |                                                             |                                                 | 8,000                                                      |
| Eastside Mutual Water Company               | 2,230                                                       |                                                                   |                                                             |                                                 | 2,230                                                      |
| Guisti Farms                                | 1,000                                                       |                                                                   |                                                             |                                                 | 1,000                                                      |
| Glenn-Colusa Irrigation District            | 25,000                                                      | 66,000                                                            |                                                             |                                                 | 91,000                                                     |
| Henle Family Limited Partnership            | 700                                                         |                                                                   |                                                             |                                                 | 700                                                        |
| Lewis Ranch                                 |                                                             | 2,310                                                             |                                                             |                                                 | 2,310                                                      |
| Maxwell Irrigation District                 | 3,000                                                       | 5,000                                                             |                                                             |                                                 | 8,000                                                      |
| Natomas Central Mutual Water Company        | 30,000                                                      |                                                                   |                                                             |                                                 | 30,000                                                     |
| Pelger Mutual Water Company                 | 4,670                                                       | 2,538                                                             |                                                             |                                                 | 4,670                                                      |
| Pleasant Grove-Verona Mutual Water Company  | 18,000                                                      | 9,000                                                             |                                                             |                                                 | 18,000                                                     |
| Princeton-Cordora-Glenn Irrigation District | 5,500                                                       | 6,600                                                             |                                                             |                                                 | 12,100                                                     |
| Provident Irrigation District               | 7,000                                                       | 9,900                                                             |                                                             |                                                 | 16,900                                                     |
| Reclamation District 108                    | 15,000                                                      | 20,000                                                            |                                                             |                                                 | 35,000                                                     |
| Reclamation District 1004                   | 7,175                                                       | 12,500                                                            |                                                             |                                                 | 19,675                                                     |
| River Garden Farms                          | 10,000                                                      | 10,000                                                            |                                                             |                                                 | 16,000                                                     |
| Sutter Mutual Water Company                 |                                                             | 18,000                                                            |                                                             |                                                 | 18,000                                                     |
| Sycamore Mutual Water Company               | 15,000                                                      | 10,000                                                            |                                                             |                                                 | 20,000                                                     |
| T&P Farms                                   | 1,200                                                       | 890                                                               |                                                             |                                                 | 1,200                                                      |

| Water Agency                                   | Groundwater Substitution <sup>1</sup><br>(acre-feet) | Cropland Idling/ Crop Shifting <sup>1</sup><br>(acre-feet) | Stored Reservoir Release <sup>1</sup><br>(acre-feet) | Conservation <sup>1</sup><br>(acre-feet) | Maximum Potential Transfer<br>(acre-feet per year) |
|------------------------------------------------|------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------|------------------------------------------|----------------------------------------------------|
| Te Velde Revocable Family Trust                | 7,094                                                | 6,975                                                      |                                                      |                                          | 7,094                                              |
| <b>American River Area</b>                     |                                                      |                                                            |                                                      |                                          |                                                    |
| City of Sacramento                             | 5,000                                                |                                                            |                                                      |                                          | 5,000                                              |
| Placer County Water Agency                     |                                                      |                                                            | 47,000                                               |                                          | 47,000                                             |
| Sacramento County Water Agency                 | 15,000                                               |                                                            |                                                      |                                          | 15,000                                             |
| Sacramento Suburban Water District             | 30,000                                               |                                                            |                                                      |                                          | 30,000                                             |
| <b>Yuba River Area</b>                         |                                                      |                                                            |                                                      |                                          |                                                    |
| Browns Valley Irrigation District              |                                                      |                                                            | 5,000                                                | 3,100                                    | 8,100                                              |
| Cordua Irrigation District                     | 12,000                                               |                                                            |                                                      |                                          | 12,000                                             |
| <b>Feather River Area</b>                      |                                                      |                                                            |                                                      |                                          |                                                    |
| Butte Water District                           | 5,500                                                | 11,500                                                     |                                                      |                                          | 17,000                                             |
| Garden Highway Mutual Water Company            | 14,000                                               |                                                            |                                                      |                                          | 14,000                                             |
| Gilsizer Slough Ranch                          | 3,900                                                |                                                            |                                                      |                                          | 3,900                                              |
| Goose Club Farms and Teichert Aggregates       | 10,000                                               | 10,000                                                     |                                                      |                                          | 10,000                                             |
| South Sutter Water District                    |                                                      |                                                            | 15,000                                               |                                          | 15,000                                             |
| Tule Basin Farms                               | 7,320                                                |                                                            |                                                      |                                          | 7,320                                              |
| Biggs-West Gridley Water District <sup>2</sup> |                                                      | 32,190                                                     |                                                      |                                          | 32,190                                             |
| Richvale Irrigation District <sup>2</sup>      |                                                      | 21,032                                                     |                                                      |                                          | 21,032                                             |
| Plumas Mutual Water Company <sup>2</sup>       | 5,000                                                | 1,750                                                      |                                                      |                                          | 4,550                                              |
| South Feather Water and Power <sup>2</sup>     |                                                      |                                                            | 10,000                                               |                                          | 10,000                                             |
| Sutter Extension Water District <sup>2</sup>   | 4,000                                                | 11,000                                                     |                                                      |                                          | 15,000                                             |
| Western Canal Water District <sup>2</sup>      |                                                      | 35,441                                                     |                                                      |                                          | 30,000                                             |
| <b>Total</b>                                   | <b>315,514</b>                                       | <b>327,110</b>                                             | <b>77,000</b>                                        | <b>3,100</b>                             | <b>652,831</b>                                     |

<sup>1</sup> 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. The last column reflects the total upper limit for each agency and will not equal the sum of all the individual transfer quantities for each agency.

<sup>2</sup> Entity holds Settlement Agreement with DWR.

Table 3-9 lists the transfer method and associated maximum annual transfer quantity potentially available from each seller. The actual quantity of water transferred in a given year, as evidenced by past dry years, is less than the totals shown in Table 3-9 and depends on a number of factors, including hydrologic conditions and available conveyance capacity. Cross Delta transfers to south-of-Delta buyers require pumping at the CVP and SWP south Delta export facilities and historically account for the majority of the transfers from sellers listed in Table 3-9. Table 3-10 lists the total quantities of cross Delta transfers from 2009 to 2015 that ranged from zero to 414,629 AF from 2009 through 2015, or approximately zero to 55 percent of the maximum total shown in Table 3-9. In

2014, TCCA received deliveries of 35,446 AF from Sacramento Valley sellers. In 2015, TCCA used 23,997 AF of transfer water from Settlement Contractors.

**Table 3-10. Historic Cross Delta Water Transfers (2009 – 2015)**

| Year              | Total Acre-Feet |
|-------------------|-----------------|
| 2009              | 274,551         |
| 2010              | 264,165         |
| 2011              | 0               |
| 2012              | 84,781          |
| 2013 <sup>1</sup> | 351,515         |
| 2014 <sup>1</sup> | 414,629         |
| 2015 <sup>1</sup> | 262,466         |

Source: DWR/SWRCB 2015

<sup>1</sup> Data for 2013, 2014 and 2015 are for quantities made available North of the Delta and include Streamflow Depletion losses (where applicable) but do not include carriage water losses across the Delta. Data for 2015 is preliminary as of May 2015 and may change as the year develops. Cross Delta water transfers using facilities operated by DWR in 2014 and 2015 were 305,699 AF and 104,348 AF respectively and Reclamation 73,930 AF and 157,018 AF respectively.

Transfers originating from the Sacramento Valley represent a small portion of the Sacramento Valley's overall water supply. Applied water in the Sacramento Valley from 2001 to 2010 has ranged from a low of about 9,168,000 AF in 2005 up to 10,931,000 AF in 2004. The driest year during this period was 2007, when applied water was about 11,017,000 AF (DWR 2014c). These figures include applied water from surface water, groundwater, and reuse.

The Lower Yuba River Accord (Yuba Accord) transfers were not included in the cumulative condition because transfers would be made available in a different geographical area than the Proposed Action. The Yuba Accord provides for both stored water and groundwater substitution transfers ranging from 60,000 AF per year and up to an additional 140,000 AF for state and federal contractors in drier years. From 2007 through 2014, Yuba Accord transfers averaged approximately 129,000 AF. Transfers under the Yuba Accord historically account for a large portion of the DWR approved water transfers and represented 73 percent of the DWR approved transfers in 2015 (DWR 2015d). Groundwater substitution transfers for the Yuba Accord would occur in the North Yuba and South Yuba subbasins and would not affect groundwater levels near the Proposed Action.

The Proposed Action could have potential cumulatively considerable impacts to air quality, biological resources, and groundwater resources. The cumulative analysis for these resources follows. The Proposed Action would not have cumulatively considerable impacts to other resources evaluated in this EA/IS.

### **Air Quality**

All counties affected by the Proposed Action are located in areas designated nonattainment for the PM<sub>10</sub> CAAQS. Additionally, Sacramento, Shasta,

Tehama, and Yolo Counties are designated nonattainment for the O<sub>3</sub> CAAQS and Sutter County is designated nonattainment-transitional for the O<sub>3</sub> CAAQS. Nonattainment status represents a cumulatively significant impact within the area. O<sub>3</sub> is a secondary pollutant, meaning that it is formed in the atmosphere from reactions of precursor compounds under certain conditions. Primary precursor compounds that lead to O<sub>3</sub> formation include volatile organic compounds and nitrogen oxides; therefore, the significance thresholds established by the air districts for VOC and NO<sub>x</sub> are intended to maintain or attain the O<sub>3</sub> CAAQS and NAAQS. Because no single project determines the nonattainment status of a region, individual projects would only contribute to the area's designation on a cumulative basis.

The significance thresholds developed by the air districts serve to evaluate if a proposed project could either 1) cause or contribute to a new violation of a CAAQS or NAAQS in the study area or 2) increase the frequency or severity of any existing violation of any standard in the area. Air districts recognize that air quality violations are not caused by any one project, but are a cumulative effect of multiple projects. Therefore, the air districts (including the Sacramento Metropolitan AQMD) have developed guidance that indicates a proposed project would be cumulatively considerable if the air quality impacts are individually significant.

Implementation of mitigation measures would reduce the Proposed Action's individual impacts to less than significant. Therefore, air quality impacts would not be cumulatively considerable.

### **Biological Resources**

Transfers under cumulative conditions could also result in additional flow in the Sacramento River. The Proposed Action would result in a slight decrease in Sacramento River flows from the Tehama Colusa Canal to the sellers' point of diversion. Other cumulative transfers would result in increased flows downstream of the sellers' point of diversion to the Delta. The cumulative change in flow due to transfers would not reduce the suitability of habitat conditions during adult immigration by Chinook salmon, steelhead, and green sturgeon. This magnitude of cumulative flow change would also not appreciably reduce spawning habitat availability and incubation, increase redd dewatering or juvenile stranding, or reduce the suitability of habitat conditions during juvenile rearing for these sensitive fish species because the increase in flow is so small compared to baseline flows. Other special-status fish species, including hardhead and Sacramento splittail would also not be affected by small changes in river flow.

The Proposed Action includes up to 50,771 acres of rice idling in Glenn, Colusa, Yolo, and Sutter counties. Transfers under the cumulative condition would result in the idling of more rice fields than those included in the Proposed Action. Based on the cropland idling quantities in Table 3-7, a maximum of 99,124 acres of rice in Glenn, Colusa, Yolo, Sutter, and Butte counties could be

idled under the cumulative condition. As stated above, the actual quantity of water transferred in a given year, as evidenced by past dry years, is less than the totals shown in Table 3-7; therefore, actual rice idling acreages would be less.

As described in the Biological Resources section, rice fields provide habitat for GGS, pacific pond turtle, and migratory birds. For the GGS and pacific pond turtle, rice idling could result in reduced forage and cover habitat, hindered movement, and increased predation risk. For migratory birds, rice idling could reduce nesting, forage, and rearing habitat. Additional rice idled under the cumulative condition could increase these effects relative to the Proposed Action.

The Proposed Action includes Environmental Commitments to reduce potential effects to special status species, including GGS and pacific pond turtle, and migratory birds. Other water transfers facilitated by Reclamation and DWR using Federal and State facilities would be required to have similar conservation measures in place to protect special status species, as shown in the ROD for Long-Term Water Transfers, Finding of No Significant Impact for the 2015 TCCA Water Transfers, Programmatic Biological Opinion for Long-Term Water Transfers, and the Draft Technical Information for Preparing Water Transfers paper published by DWR and Reclamation. As a result, cumulative impacts to these species would not be expected to be significant. Further, the Environmental Commitments would reduce potential effects of the Proposed Action on special status species under cumulative conditions, such that the Proposed Action's contribution to any such impacts would be minimal.

Groundwater substitution transfers under the cumulative condition would also result in streamflow depletion and potentially affect flows for fish and natural communities. The transfers included in Table 3-7 are generally in different areas of the Sacramento Valley than those included in the Proposed Action and would not substantially increase streamflow depletion in any one area. As a result, any losses in stream flows would be minor and effects to fisheries or natural communities would be less than significant under the cumulative condition.

### **Groundwater Resources**

The reduction in recharge due to the decrease in precipitation and runoff in the past years in addition to the increase in groundwater substitution transfers would lower groundwater levels. The groundwater modeling for the Proposed Action suggests that the pumping of groundwater used in lieu of the surface water made available for transfer in addition to the groundwater pumping which would occur as a result of the dry conditions would not cause significant adverse effects to groundwater levels with the implementation of Mitigation Measure GW-1. The additional groundwater substitution transfers in the cumulative condition are in different areas of the Sacramento Valley (focused in the Feather and American river areas rather than the Sacramento River area); therefore, this addition to the cumulative condition is not likely to cause a significant cumulative impact.

Reclamation requires well review, monitoring, and mitigation to reduce effects to third party groundwater users for approval of transfers. Only wells that meet the requirements outlined in the *DRAFT Technical Information for Preparing Water Transfer Proposals* (Reclamation and DWR 2015) will be allowed to participate in a transfer. Reclamation will not approve transfers if appropriate monitoring and mitigation does not occur. Monitoring and mitigation programs would reduce cumulative groundwater effects. Reclamation will verify that monitoring and mitigation are appropriately implemented and groundwater effects do not occur. Coordination of groundwater programs in the Sacramento Valley would also minimize and avoid the potential for cumulative effects to groundwater resources. DWR is involved in multiple groundwater programs in the Sacramento Valley, including monitoring programs. Reclamation will work with DWR to track program activities, collect and combine data, and assess potential groundwater effects. Because of the required groundwater monitoring and mitigation for transfer approval and agency coordination, the Proposed Action would not result in a cumulatively considerable contribution to effects on groundwater.

**c) No Impact.** The Proposed Action would not result in environmental effects that cause substantial adverse impacts to human beings. Effects in the sellers' area would be temporary, occurring in only 2016, and do not present a substantial risk to water supplies to human beings. The Proposed Action would provide additional water to the buyers' area, which would benefit agricultural production and the regional economies in the buyers' area. There would be no long-term effects of the Proposed Action.

*This page intentionally left blank.*

## Chapter 4

# Other Federal Environmental Compliance Requirements

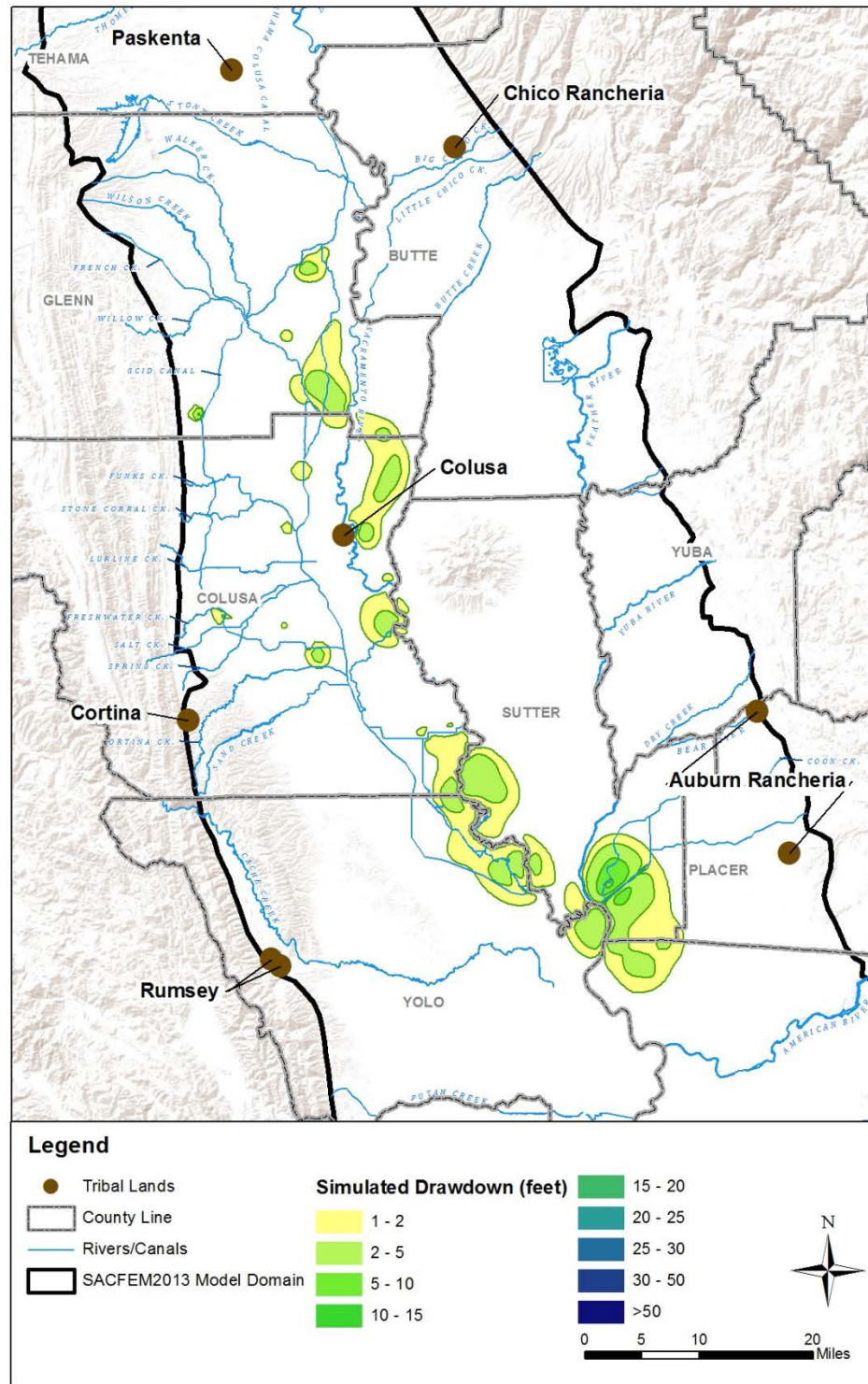
In addition to resources analyzed in Chapter 3, Department of the Interior Regulations, Executive Orders, and Reclamation guidelines require a discussion of the following additional items when preparing environmental documentation.

### 4.1 Indian Trust Assets (ITAs)

ITAs are defined as legal interests in property held in trust by the U.S. government for Indian tribes or individuals, or property protected under U.S. law for federally recognized Indian tribes or individuals. ITAs can include land, minerals, federally-reserved hunting and fishing rights, federally-reserved water rights, and in-stream flows associated with a reservation or Rancheria. By definition, ITAs cannot be sold, leased, or otherwise encumbered without approval of the U.S. The following ITAs overlay the boundaries of the Sacramento Valley Groundwater Basin:

- Auburn Rancheria
- Chico Rancheria
- Colusa
- Cortina
- Paskenta
- Rumsey

Groundwater substitution is the only transfer method under the Proposed Action that could affect ITAs. Auburn Rancheria, Cortina, and Rumsey lie on the border of the basin, where groundwater levels would be less affected by proposed groundwater pumping. Groundwater modeling in the Sacramento Valley Groundwater Basin shows that there would be essentially no effect to groundwater table elevations from groundwater substitution transfers near the Chico Rancheria, and Paskenta sites (see Figure 4-1). The Colusa Rancheria is near an area of potential drawdown; however, the drawdown is on the opposite side of the river from the Colusa Rancheria. The changes in groundwater levels near the Colusa Rancheria would be negligible and would not affect groundwater pumping.



**Figure 4-1. Groundwater Effects to ITAs in the Sacramento Valley Groundwater Basin**

The Redding Rancheria falls within the Redding Groundwater Basin, which is where groundwater substitution transfers would occur by Anderson-Cottonwood ID. The groundwater evaluation concludes that there would not be significant effects to groundwater elevations in the Redding Groundwater Basin based on past pump tests and that Anderson-Cottonwood ID would develop and implement a Monitoring Program and Mitigation Plan because of the uncertainty of changes in groundwater levels in a critical water year. As a result, there would be no effects to the Redding Rancheria.

Because groundwater substitution transfers would not affect groundwater table elevations near the ITA sites, the Proposed Action would not affect ITAs.

## **4.2 Indian Sacred Sites**

As defined by Executive Order 13007: Indian Sacred Sites, a sacred site “means any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site.” The affected environment for the Proposed Action does not include Federal land; therefore, there is no potential for Indian Sacred Sites to be affected by the Proposed Action.

## **4.3 Socioeconomics**

Agriculture is a primary industry in the counties in Colusa, Glenn, Sutter, and Yolo counties (the counties where cropland idling could occur). In 2013, the combined value of agricultural production in the four counties was approximately \$3.0 billion. Colusa County had a gross value of agricultural production at \$920.1 million; followed by Glenn County at \$792.2 million, Yolo County at \$721.6 million, and Sutter County at \$599.3 million (California Department of Food and Agriculture 2015). Table 4-1 summarizes the regional economy in 2013 for Glenn, Colusa, Sutter, and Yolo counties. The counties were combined into one region because many of the participating sellers’ service area cross county boundaries and the regional economies are generally similar with respect to the major industries. It is important to note that Yolo County represents a significant portion of the employment, labor income, and output in the region because of its proximity to the urban Sacramento area and economic activities associated with the University of California at Davis.

**Table 4-1. Summary of 2014 Regional Economy in Glenn, Colusa, Sutter, and Yolo Counties**

|                                                  | <b>Glenn<br/>Employment</b> | <b>Glenn<br/>Earnings<sup>1</sup></b> | <b>Colusa<br/>Employment</b> | <b>Colusa<br/>Earnings<sup>1</sup></b> | <b>Sutter<br/>Employment</b> | <b>Sutter<br/>Earnings<sup>1</sup></b> | <b>Yolo<br/>Employment</b> | <b>Yolo<br/>Earnings<sup>1</sup></b> |
|--------------------------------------------------|-----------------------------|---------------------------------------|------------------------------|----------------------------------------|------------------------------|----------------------------------------|----------------------------|--------------------------------------|
| Total                                            | 12,555                      | \$669,056                             | 11,787                       | \$717,994                              | 45,193                       | \$1,960,096                            | 124,228                    | \$8,057,716                          |
| Farm                                             | 2,295                       | \$219,118                             | 2,104                        | \$219,680                              | 3,229                        | \$199,822                              | 2,967                      | \$258,029                            |
| Nonfarm                                          | 10,260                      | \$449,938                             | 9,683                        | \$498,314                              | 41,964                       | \$1,760,274                            | 121,261                    | \$7,799,687                          |
| Private nonfarm                                  | 8,224                       | \$306,948                             | 7,514                        | \$353,948                              | 37,383                       | \$1,406,683                            | 83,842                     | \$4,153,655                          |
| Forestry, fishing, and related activities        | (D)                         | (D)                                   | (D)                          | (D)                                    | 1,593                        | \$59,958                               | 3,587                      | \$131,327                            |
| Mining                                           | (D)                         | (D)                                   | (D)                          | (D)                                    | 213                          | \$12,432                               | 396                        | \$19,235                             |
| Utilities                                        | 61                          | \$7,405                               | 57                           | \$7,774                                | 76                           | \$9,697                                | (D)                        | (D)                                  |
| Construction                                     | 478                         | \$24,101                              | 213                          | \$11,215                               | 2,058                        | \$99,444                               | 4,125                      | \$277,512                            |
| Manufacturing                                    | 743                         | \$42,217                              | 1,359                        | \$88,608                               | 1,801                        | \$97,380                               | 6,494                      | \$542,302                            |
| Wholesale trade                                  | 416                         | \$23,009                              | 760                          | \$70,175                               | 1,406                        | \$110,652                              | (D)                        | (D)                                  |
| Retail trade                                     | 1,040                       | \$30,771                              | 650                          | \$23,658                               | 5,894                        | \$180,142                              | 9,425                      | \$354,949                            |
| Transportation and warehousing                   | 609                         | \$30,772                              | 469                          | \$20,862                               | 2,218                        | \$105,354                              | 6,865                      | \$410,258                            |
| Information                                      | (D)                         | (D)                                   | 31                           | \$1,261                                | 358                          | \$18,999                               | 1,254                      | \$85,526                             |
| Finance and insurance                            | 252                         | \$9,058                               | 180                          | \$11,957                               | 1,646                        | \$51,929                               | 2,316                      | \$113,404                            |
| Real estate and rental and leasing               | 318                         | \$6,436                               | 410                          | \$12,675                               | 3,074                        | \$58,931                               | 4,220                      | \$122,881                            |
| Professional, scientific, and technical services | 297                         | \$9,415                               | 247                          | \$6,746                                | 1,843                        | \$66,202                               | 7,823                      | \$439,414                            |
| Management of companies and enterprises          | 0                           | \$0                                   | 0                            | \$0                                    | 548                          | \$11,810                               | 1,423                      | \$109,887                            |
| Administrative and waste management services     | 298                         | \$9,055                               | 267                          | \$6,537                                | 2,541                        | \$72,668                               | 4,394                      | \$125,159                            |
| Educational services                             | (D)                         | (D)                                   | (D)                          | (D)                                    | 451                          | \$5,752                                | 1,555                      | \$24,090                             |
| Health care and social assistance                | (D)                         | (D)                                   | (D)                          | (D)                                    | 5,097                        | \$265,443                              | 9,943                      | \$511,734                            |
| Arts, entertainment, and recreation              | 149                         | \$3,124                               | 90                           | \$1,180                                | 915                          | \$11,834                               | 1,925                      | \$28,525                             |
| Accommodation and food services                  | 634                         | \$11,639                              | 658                          | \$14,000                               | 2,935                        | \$62,353                               | 6,601                      | \$145,178                            |
| Other services, except public administration     | 809                         | \$28,440                              | 490                          | \$16,536                               | 2,716                        | \$105,703                              | 5,670                      | \$212,600                            |
| Government and government enterprises            | 2,036                       | \$142,990                             | 2,169                        | \$144,366                              | 4,581                        | \$353,591                              | 37,419                     | \$3,646,032                          |

Source: U.S. Bureau of Economic Analysis 2015

<sup>1</sup> Thousands of dollars

(D) Not shown to avoid disclosure of confidential information, but the estimates for this item are included in the totals.

Facing a water shortage, growers would take actions to protect permanent crops first to protect their investments. If available, growers would likely pump groundwater to substitute for reduced surface water supplies. If groundwater is not available, growers would idle field crops and use available surface water to irrigate permanent crops. Cropland idling in other districts would also occur under the No Action Alternative, but estimates are unavailable at this time because other districts have not yet considered what actions they will take to address water shortages this year.

In the TCCA buyer area, growers generally do not have access to groundwater supplies to irrigate crops. Water shortages to the TCCA Member Units may be severe enough that growers would not have the available water needed to irrigate permanent crops. This could cause permanent crops to die or be permanently damaged. Damage to and loss of permanent crops would have long-term adverse effects to the regional economy in the Sacramento Valley. If the crop is lost, growers would lose annual revenues earned from sales and their initial investments to establish the crop. These economic effects would last beyond 2016. There may also be increased costs to remove the crops and prepare the land for subsequent planting. These would be adverse economic impacts under the No Action Alternative.

Under the Proposed Action, a maximum of 50,771 acres of rice could be idled in addition to rice acres idled as a result of the drought. Under the Proposed Action, growers selling water for transfers would be compensated for their expected losses in income that they would have received for selling a crop. As a result, growers would not experience a net loss in income and would presumably receive more revenue than if the crop were produced, which would be an economic benefit to participating growers.

Adverse regional economic effects would occur to businesses and individuals who support farming activities, such as farm workers, fertilizer and chemical dealers, wholesale and agricultural service providers, truck transport, and others involved in crop production and processing. These businesses and individuals would not receive compensation from the water transfer. Cropland idling would result in direct effects to employment, labor income and output. This analysis estimates effects to employment to represent the magnitude of potential economic effects of the proposed cropland idling. There would be similar relative effects to labor income and output to the regional economy.

The transfer water would be used to irrigate permanent crops in Tehama, Glenn, Colusa, and Yolo counties that would have little or no water under the No Action Alternative. This would offset some of the economic effects of cropland idling because water would be used to irrigate crops within the same economic region and there would be fewer leakages outside the region. For example, some farm workers could travel within the region to the crops that would be

irrigated with transferred water and they would not lose their jobs as a result of idling. Some businesses that support the region would also experience less of a decline in sales because the transferred water would be used locally and farm related supplies would still be purchased. Because the buyers and sellers are within the same or proximate economic region, there would be fewer adverse economic effects of cropland idling than if the sellers were more geographically separated.

Rice production provides approximately 2.5 farm jobs per 1,000 acres (University of California Cooperative Extension 2012). Based on the maximum acreages proposed for idling as a result of the Proposed Action, the direct effects of rice idling would be approximately 127 jobs lost in Colusa, Glenn, Sutter, and Yolo counties. These job losses would largely occur in the agricultural sector. Some of these direct effects may be offset if farm workers can shift from working fields that are idled to fields where the transfer water is being used.

There would also be secondary regional economic impacts as a result of increased idling. Secondary effects occur because of the linkages among industries and include effects to employment, income, and output of support industries and as a result of reduced household spending. Secondary effects would occur to agricultural support businesses that would have reduced sales because growers would not purchase inputs or rent equipment. Transportation businesses and rice mills would also be affected because there would be less rice harvested.

At the regional level, the direct and secondary economic effects would not be substantial. Relative to the baseline economy, the effects would be minor. Further, the Proposed Action would last for one year and growers could put the land back into agricultural production in the subsequent year if water supplies increase. Therefore, economic effects from cropland idling would be a temporary effect.

Effects may be more adverse in local communities. Rural communities have a much smaller economic base, and any changes to economic levels would be more adverse relative to a large regional economy. Water Code Section 1745.05(b) requires a public hearing under some circumstances in which the amount of water from land idling exceeds 20 percent of the water that would have been applied or stored by the water supplier absent the water transfer in any given hydrologic year. Third parties would be able to attend the hearing and could argue to limit the transfer based on its economic effects.

In the buyer area, water transfers under the Proposed Action would provide water for irrigation that would help maintain crop production. Even with transfers, growers would continue to face water shortages and take actions to address reduce supplies. Transfer water would be used to irrigate permanent crops to keep them alive through the dry year and support long-term production.

Permanent crops are typically more labor intensive and have higher value than field crops. Continued irrigation of permanent crops through the 2016 irrigation season would support farm labor and provide revenue to the region through 2016 and in the long-term. Transfer water would help local farm economies in the TCCA area of the Sacramento Valley by providing employment and wages to farm laborers. Transfers would protect growers' investments in permanent crops and farm income. Transfers would provide long-term economic benefits by keeping permanent crops alive through the 2016 dry conditions. If permanent crops do not survive through 2016, there would be substantial long-term adverse economic effects to the buyer area by reducing employment and income in subsequent years. The Proposed Action would benefit the regional economy in the buyer area.

## 4.4 Environmental Justice

The 1994 Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires all Federal agencies to conduct "programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons (including populations) from participation in, denying persons (including populations) the benefits of, or subjecting persons (including populations) to discrimination under, such programs, policies, and activities, because of their race, color, or national origin." Cropland idling could affect farm labor employment by temporarily reducing the amount of agricultural land in production or the number of farm workers needed to work existing land. Table 4-3 shows demographics and income in the counties where cropland idling could occur. Colusa County had a Hispanic population greater than 50 percent. All counties had a lower median household income. Colusa, Glenn, and Sutter counties had higher unemployment rates than the state and Sutter and Glenn had higher poverty rates than the state. These statistics indicate a potential for environmental justice effects in the seller area.

**Table 4-2. 2010-2014 Demographics and Income in Transferring Counties**

|                                  | CA         | Colusa | Glenn  | Sutter | Yolo    |
|----------------------------------|------------|--------|--------|--------|---------|
| <b>Population</b>                | 38,066,920 | 21,424 | 28,019 | 95,067 | 204,162 |
| <b>Ethnicity<sup>1</sup> (%)</b> |            |        |        |        |         |
| Hispanic or Latino               | 38.2%      | 56.7%  | 38.9%  | 29.4%  | 31.0%   |
| <b>Race<sup>2</sup> (%)</b>      |            |        |        |        |         |
| White                            | 65.8%      | 96.3%  | 87.9%  | 68.6%  | 94.1%   |
| African American                 | 7.1%       | 81.4%  | 1.5%   | 2.0%   | 66.0%   |
| American Indian                  | 1.9%       | 0.9%   | 3.2%   | 1.3%   | 2.6%    |
| Asian                            | 15.4%      | 1.3%   | 2.7%   | 14.6%  | 1.0%    |
| Pacific Islander                 | 0.8%       | 1.3%   | 0.7%   | 0.3%   | 13.2%   |
| Some Other Race                  | 14.0%      | 0.1%   | 7.5%   | 7.5%   | 0.6%    |
| Multirace                        | 65.8%      | 11.2%  | 87.9%  | 5.6%   | 10.6%   |

|                                                        | CA       | Colusa   | Glenn    | Sutter   | Yolo     |
|--------------------------------------------------------|----------|----------|----------|----------|----------|
| <b>Poverty Rate (2010-2014)<sup>3</sup> (%)</b>        | 12.3%    | 11.9%    | 13.7%    | 13.7%    | 10.3%    |
| <b>Unemployment Rate (%)</b>                           | 11.0%    | 12.4%    | 13.5%    | 14.0%    | 9.6%     |
| <b>Median Household Income (2010-2014)<sup>4</sup></b> | \$61,489 | \$50,503 | \$40,106 | \$51,527 | \$55,508 |

Source: U.S. Census Bureau 2015

Notes:

<sup>1</sup> The U.S. Census Bureau classifies Hispanic or Latino as an ethnicity, and surveys for this percentage across all races; therefore, the actual percentage of persons of only Hispanic or Latino origin could be smaller than the stated percentage (U.S. Census Bureau 2015).

<sup>2</sup> A minority is defined as a member of the following population groups: American Indian/Alaskan Native, Asian or Pacific Islander, Black (non-Hispanic), or Hispanic (U.S. Census Bureau 2015).

<sup>3</sup> The U.S. Census Bureau classifies families and persons as *below poverty* "if their total family income or unrelated individual income was less than the poverty threshold" as defined for all parts of the country by the federal government (U.S. Census Bureau 2015).

<sup>4</sup> Household income is defined by the U.S. Census Bureau as "the sum of money income received in the calendar year by all household members 15 years old and over" (U.S. Census Bureau 2015).

Table 4-3 shows 2004-2014 farm employment in the counties that could idle cropland. Farm employment would be the most directly affected by cropland idling transfers.

**Table 4-3. Farm Employment, 2004-2014**

|             | Colusa, Glenn, Sutter and Yolo Counties | Annual Percent Change |
|-------------|-----------------------------------------|-----------------------|
| <b>2004</b> | 11,330                                  | --                    |
| <b>2005</b> | 11,390                                  | 0.5%                  |
| <b>2006</b> | 11,390                                  | 0.0%                  |
| <b>2007</b> | 12,080                                  | 6.1%                  |
| <b>2008</b> | 12,310                                  | 1.9%                  |
| <b>2009</b> | 12,580                                  | 2.2%                  |
| <b>2010</b> | 12,950                                  | 2.9%                  |
| <b>2011</b> | 13,270                                  | 2.5%                  |
| <b>2012</b> | 13,380                                  | 0.8%                  |
| <b>2013</b> | 13,700                                  | 2.4%                  |
| <b>2014</b> | 14,210                                  | 3.7%                  |

Source: Employment Development Department (EDD) 2015

<http://www.labormarketinfo.edd.ca.gov/geography/lmi-by-county.html>

Economic effects in the buyers' and sellers' areas as a result of the reduced supplies in this critical hydrologic year under the No Action Alternative are described in Section 4.3. These effects would also be relevant for environmental justice issues. In the TCCA area, reduced water supplies could cause long-term damage to or loss of permanent crops, which would reduce farm worker employment for the long-term. This could result in a disproportionate impact to low income and minority workers under the No Action Alternative. In the sellers' area, field crops would likely be idled in response to water shortages and available surface water supplies would be shifted to irrigate permanent crops. There would be some losses in employment of low income and minority workers on field crops, but employment needs for

labor-intensive permanent crops would remain unchanged. Effects in the sellers' area would be temporary.

Under the Proposed Action, cropland idling transfers could disproportionately and adversely affect minority and low-income farm workers by reducing agricultural production. A maximum of 50,771 acres of rice could be idled under the Proposed Action. Based on the maximum idling acreage under the Proposed Action, approximately 127 farm workers jobs would be lost in Glenn, Colusa, Sutter, and Yolo counties (1 percent of total 2014 farm employment). This magnitude of job losses is within historic annual fluctuations in farm worker employment. Annual changes in farm worker employment from 2004 to 2014 were 2 percent or greater in 6 years (EDD 2015). All farm worker effects would be temporary and only occur during the 2016 crop season. Cropland idling under the Proposed Action would not result in an adverse and disproportionately high effect to farm employment.

Water transfers under the Proposed Action would provide water to agricultural users in the buyers' area. Increased water supply would mostly be used to irrigate permanent crops that would not otherwise be irrigated due to water shortages under the No Action Alternative. This would provide employment for the labor intensive, permanent crops, which would provide farm employment for low income and minority workers. This would be a beneficial effect to environmental justice populations.

## **4.5 Consultation and Coordination**

### **4.5.1 2016 Stakeholder Involvement**

Reclamation and the TCCA continue to coordinate with interested sellers to implement water transfers in 2016. Reclamation has also coordinated with DWR on water transfers and use of SWP facilities. Tables 2-1 and 2-2 are the result of coordination among agencies.

### **4.5.2 Resource Agency Involvement**

In 2015, USFWS issued a Programmatic Biological Opinion on Long-Term Water Transfers from 2015 to 2024 that includes transfers to TCCA and other users. TCCA water transfers in 2016 fall under the Programmatic Biological Opinion. For transfer years 2016 to 2024, USFWS requires Reclamation to submit an annual report that describes the proposed action for the calendar year and provides detailed monitoring reports for previous years actions. TCCA is working with Reclamation to provide a report on 2015 water transfers to USFWS.

#### **4.5.3 Public Comments**

Reclamation and the TCCA released the Draft EA/IS for a 20 day public review period, beginning on February 4, 2016.

## Chapter 5 References

- Anderson-Cottonwood Irrigation District (Anderson-Cottonwood ID). 2011. Anderson-Cottonwood Irrigation District Integrated Regional Water Management Program- Groundwater Production Element Project. August 2011.
- \_\_\_\_\_. 2013. Initial Study and Proposed Negative Declaration for Anderson-Cottonwood Irrigation District's 2013 Water Transfer Program. April 2013.
- \_\_\_\_\_. 2014. Final Water Transfer Monitoring Summary Report 2013 Water Transfer Agreement SWPAO #13-707 Anderson-Cottonwood Irrigation District. May.2014.
- Bennett, George L., V, Miranda S. Fram and Kenneth Belitz. 2011. Status of Groundwater Quality in the Southern, Middle, and Northern Sacramento Valley Study Units, 2005-2008: California GAMA Priority Basin Project. Available at: <http://pubs.usgs.gov/sir/2011/5002/pdf/sir20115002.pdf> [Accessed on January 19, 2016].
- Bergfeld, Lee. 2014. Personal Communication with C. Buckman of CDM Smith, Sacramento.
- Brush, C.F., Dogrul, E.C., and Kadir, N.T. 2013. Development and Calibration of the California Central Valley Groundwater-Surface Water Simulation Model (C2VSim), Version 3.02-CG. Available at: [http://baydeltaoffice.water.ca.gov/modeling/hydrology/C2VSim/download/C2VSim\\_Model\\_Report\\_Final.pdf](http://baydeltaoffice.water.ca.gov/modeling/hydrology/C2VSim/download/C2VSim_Model_Report_Final.pdf) [Accessed on January 20, 2016].
- Bureau of Reclamation (Reclamation). 2016. Daily CVP Water Supply Report. Available at: <http://www.usbr.gov/mp/cvo/vungvari/dayrpt.pdf> [Accessed on January 3, 2016]
- Bureau of Reclamation and California Department of Water Resources (Reclamation and DWR). 2015. DRAFT Technical Information for Preparing Water Transfer Proposals. Available at: [http://www.water.ca.gov/watertransfers/docs/2016\\_Water\\_Transfer\\_White\\_Paper.pdf](http://www.water.ca.gov/watertransfers/docs/2016_Water_Transfer_White_Paper.pdf) [Accessed on January 4, 2016].
- Bureau of Reclamation and San Luis & Delta-Mendota Water Authority. 2015. Long-Term Water Transfers Environmental Impact

- Statement/Environmental Impact Report. Available at:  
[http://www.usbr.gov/mp/nepa/nepa\\_projdetails.cfm?Project\\_ID=18361](http://www.usbr.gov/mp/nepa/nepa_projdetails.cfm?Project_ID=18361)  
[Accessed on January 4, 2016]
- Buttner, Paul. 2014. Blog on California Rice Commission, Wintering Waterfowl Habitat Concerns Loom Large. September 16. Available at:  
<http://calrice.org/blog/?id=1410890340&author=California+Rice+Commission> [Accessed on January 19, 2016].
- Byron Buck & Associates. 2009. "Comparison of Summertime Emission Credits from Land Fallowing Versus Groundwater Pumping." Memorandum from Byron Buck to Teresa Geimer, Drought Water Bank Manager. May 18.
- California Air Resources Board (CARB). 2013. State Area Designations. Available at: <http://www.arb.ca.gov/desig/adm/adm.htm> [Accessed on January 19, 2015].
- \_\_\_\_\_. 2014. California Greenhouse Gas Emission Inventory: 2000-2012. May. Available at:  
[http://www.arb.ca.gov/cc/inventory/pubs/reports/ghg\\_inventory\\_00-12\\_report.pdf](http://www.arb.ca.gov/cc/inventory/pubs/reports/ghg_inventory_00-12_report.pdf) [Accessed on January 19, 2016].
- California Department of Conservation. 1997. California Agricultural Land Evaluation and Site Assessment Model.
- \_\_\_\_\_. 2007. California Geologic Survey Fault Rupture Zones in California; Alquist-Priolo Earthquake Fault Zoning Act with Index to Earthquake Fault Zone Maps. Special Publication 42, Interim Revision 2007. Available at: <ftp://ftp.consrv.ca.gov/pub/dmg/pubs/sp/Sp42.pdf> [Accessed on January 12, 2016].
- California Department of Food and Agriculture. 2015. California Agricultural Commissioners Reports. Available at:  
[http://www.nass.usda.gov/Statistics\\_by\\_State/California/Publications/AgComm/Detail/](http://www.nass.usda.gov/Statistics_by_State/California/Publications/AgComm/Detail/) [Accessed on January 19, 2016].
- California Department of Water Resources (DWR). 2003. California's Groundwater: Bulletin 118, Update 2003. October.
- \_\_\_\_\_. 2010. Central Valley Flood Management Planning Program. State Plan of Flood Control Descriptive Document. Available at:  
<http://www.water.ca.gov/cvfm/docs/SPFCDescriptiveDocumentNov2010.pdf> [Accessed on January 13, 2016].
- \_\_\_\_\_. 2014a. Conaway Ranch Extensometer 09N03E08C004M Ground Surface Displacement Plot.  
<http://www.water.ca.gov/waterdatalibrary/docs/Hydstra/docs/09N03E08>

[C004M/POR/GROUND SURFACE DISPLACEMENT POINT PLOT.PNG](#) [Accessed on January 20, 2016].

\_\_\_\_\_. 2014b. Summary of Recent, Historical, and Estimated Potential for Future Land subsidence in California. Available at: [http://www.water.ca.gov/groundwater/docs/Summary\\_of\\_Recent\\_Historical\\_Potential\\_Subsidence\\_in\\_CA\\_Final\\_with\\_Appendix.pdf](http://www.water.ca.gov/groundwater/docs/Summary_of_Recent_Historical_Potential_Subsidence_in_CA_Final_with_Appendix.pdf). [Accessed on January 20, 2016].

\_\_\_\_\_. 2014c. Final California Water Plan Update 2013, Sacramento River Hydrologic Region Regional Report. Available at: [http://www.waterplan.water.ca.gov/docs/cwpu2013/Final/Vol2\\_SacramentoRiverRR.pdf](http://www.waterplan.water.ca.gov/docs/cwpu2013/Final/Vol2_SacramentoRiverRR.pdf). [Accessed on January 20, 2016].

\_\_\_\_\_. 2015a. Glenn County Extensometer 21N02W33M001M Ground Surface Displacement Plot. Available at: <http://www.water.ca.gov/waterdatalibrary/docs/Hydstra/docs/21N02W33M001M/POR/GROUND SURFACE DISPLACEMENT POINT PLOT.PNG>. [Accessed on January 9, 2015].

\_\_\_\_\_. 2015b. Sacramento River at Colusa (COL) Mean Daily Flow. Available at: [http://cdec.water.ca.gov/histPlot/DataPlotter.jsp?staid=COL&sensor\\_no=41&duration=D&start=01%2F01%2F2014+00%3A00&end=12%2F30%2F2015+00%3A00&geom=Small](http://cdec.water.ca.gov/histPlot/DataPlotter.jsp?staid=COL&sensor_no=41&duration=D&start=01%2F01%2F2014+00%3A00&end=12%2F30%2F2015+00%3A00&geom=Small). [Accessed on February 2, 2016].

\_\_\_\_\_. 2015c. Glenn County Extensometer 22N02W15C002M Ground Surface Displacement Plot. Available at: <http://www.water.ca.gov/waterdatalibrary/docs/Hydstra/docs/22N02W15C002M/POR/GROUND SURFACE DISPLACEMENT POINT PLOT.PNG>. [Accessed on January 20, 2016].

\_\_\_\_\_. 2015d. 2015 Transfers Requiring Use of DWR Facilities. Updated October 5, 2015. Available at: [http://www.water.ca.gov/watertransfers/docs/Transfer\\_Proposals.pdf](http://www.water.ca.gov/watertransfers/docs/Transfer_Proposals.pdf) [Accessed on November 13, 2015.]

DWR and State Water Resources Control Board (SWRCB). 2015. Background and Recent History of Water Transfers in California. Prepared for the Delta Stewardship Council. July. Available at: [http://www.water.ca.gov/watertransfers/docs/Background\\_and\\_Recent\\_History\\_of\\_Water\\_Transfers.pdf](http://www.water.ca.gov/watertransfers/docs/Background_and_Recent_History_of_Water_Transfers.pdf) [Accessed on January 20, 2016].

California Rice Commission. 2011. Wildlife Known to Use California Ricelands. Third Edition, 2011. Available at: <http://calrice.org/pdf/wildlife/Species-Report.pdf> [Accessed on January 19, 2016].

- Central Valley Joint Venture. 2006. Implementation Plan. Available at:  
[http://www.centralvalleyjointventure.org/assets/pdf/CVJV\\_fnl.pdf](http://www.centralvalleyjointventure.org/assets/pdf/CVJV_fnl.pdf)  
[Accessed on November 12, 2015].
- CH2M Hill. 2003. Draft Redding Basin Water Resources Management Plan Phase 2C Report. Prepared for Redding Area Water Council. May **as cited in** Anderson-Cottonwood Irrigation District (ACID) 2011. Anderson-Cottonwood Irrigation District Integrated Regional Water Management Program- Groundwater Production Element Project. August 2011.
- \_\_\_\_\_. 2007. Redding Basin Water Resources Management Plan Environmental Impact Report. January.
- County of Placer. 2002. Auburn Ravine/Coon Creek Restoration Plan. Available at:  
<http://www.placer.ca.gov/departments/communitydevelopment/planning/placerlegacy/watershedplanning/arccrestorplan> [Accessed on January 13, 2016].
- Department of Fish and Wildlife (DFW). 2015a. State and Federally Listed Endangered and Threatened Animals in California.
- \_\_\_\_\_. 2015b. Fully Protected Animals. Available at:  
[http://www.dfg.ca.gov/wildlife/nongame/t\\_e\\_spp/fully\\_pro.html#Reptiles](http://www.dfg.ca.gov/wildlife/nongame/t_e_spp/fully_pro.html#Reptiles) [Accessed on January 19, 2015].
- \_\_\_\_\_. 2015c. California Natural Diversity Database. Special Animals List. January 2015.
- Employment Development Department (EDD). 2015. Labor Market Information by County. Available at:  
<http://www.labormarketinfo.edd.ca.gov/geography/lmi-by-county.html>  
[Accessed on January 20, 2016].
- Faunt, C.C., ed. 2009. Groundwater Availability of the Central Valley Aquifer, California: U.S. Geological Survey Professional Paper 1766, 225 p.
- Feather River Air Quality Management District. 2010. Indirect Source Review Guidelines: A Technical Guide to Assess the Air Quality Impact of Land Use Projects Under the California Environmental Quality Act. Available at: <http://www.fraqmd.org/CEQA%20Planning.html>  
[Accessed on January 12, 2016].
- Forster, P., V. Ramaswamy, P. Artaxo, T. Berntsen, R. Betts, D.W. Fahey, J. Haywood, J. Lean, D.C. Lowe, G. Myhre, J. Nganga, R. Prinn, G. Raga, M. Schulz and R. Van Dorland. 2007. Changes in Atmospheric Constituents and in Radiative Forcing. In: *Climate Change 2007: The*

- Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
- Glenn County. 1993. Glenn County General Plan. Volume III – Setting. June 15. Available at:  
[http://gcplanupdate.net/\\_documents/docs/VOLUME%20III-SETTING-1.pdf](http://gcplanupdate.net/_documents/docs/VOLUME%20III-SETTING-1.pdf) [Accessed on January 20, 2015].
- Halstead. B.J., G.D. Wylie, and M.L. Casazza. 2014. Ghost of Habitat Past: Historic Habitat Affects the Contemporary Distribution of Giant Garter Snakes in a Modified Landscape. *Animal Conservation* 17(2): 144-153.
- MBK Engineers. 2015. Final Report on 2014 Forbearance Agreements.
- Miller. M.R., J. D. Garr, and P. S. Coates. 2010. Changes in the Status of Harvested Rice Fields in the Sacramento Valley, California: Implications for Wintering Waterfowl. Society of Wetland Scientist. July.
- Petrie and Petrik. 2010. Assessing Waterbird Benefits from Water Use in California Ricelands. May.
- Sacramento Metropolitan Air Quality Management District. 2014a. Sacramento Metropolitan AQMD Thresholds of Significance Table. November. Available at:  
<http://www.airquality.org/ceqa/cequguideupdate/Ch2TableThresholds.pdf> [Accessed on January 12, 2016].
- \_\_\_\_\_. 2014b. CEQA Guide to Air Quality Assessment. Chapter 8: Cumulative Air Quality Impacts. November. Available at:  
<http://www.airquality.org/ceqa/cequguideupdate/Ch8CumulativeFinal.pdf> [Accessed on January 20, 2016].
- Sacramento River Watershed Program. 2010. Westside Subregion: Cache Creek Watershed. Available at:  
<http://www.sacriver.org/aboutwatershed/roadmap/watersheds/westside/cache-creek-watershed> [Accessed on January 20, 2016].
- Sutter County. 2015. Species Proposed for Coverage Under the YSRCP (2015).
- SWRCB. 1999. A Guide to Water Transfers. July 1999. Draft. Division of Water Rights State Water Resources Control Board. Available at:  
[http://www.waterboards.ca.gov/waterrights/water\\_issues/programs/water\\_transfers/docs/watertransferguide.pdf](http://www.waterboards.ca.gov/waterrights/water_issues/programs/water_transfers/docs/watertransferguide.pdf) [Accessed on January 14, 2016].

- \_\_\_\_\_. 2011. The California 2010 303(d) list (with sources). Available at: [http://www.waterboards.ca.gov/water\\_issues/programs/tmdl/integrated2010.shtml](http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml) [Accessed on: January 20, 2015].
- \_\_\_\_\_. 2015. Drought Conditions Force Difficult Management Decisions for Sacramento River Temperature. Available at: [http://www.waterboards.ca.gov/press\\_room/press\\_releases/2015/pr061615\\_shasta.pdf](http://www.waterboards.ca.gov/press_room/press_releases/2015/pr061615_shasta.pdf) [Accessed on December 23, 2015].
- The Climate Registry. 2015a. 2015 Climate Registry Default Emission Factors. Available at: <http://www.theclimateregistry.org/wp-content/uploads/2015/04/2015-TCR-Default-EF-April-2015-FINAL.pdf> [Accessed on January 12, 2016].
- \_\_\_\_\_. 2015b. Utility-Specific Emission Factors. Available at: <http://www.theclimateregistry.org/resources/protocols/general-reporting-protocol/> [Accessed on January 12, 2016].
- The Natomas Basin Conservancy. 2003. Final Natomas Basin Habitat Conservation Plan. Volume 1. April. Available at: <http://www.natomasbasin.org/helpful-documents/2003-nbhcp-related-documents/> [Accessed on January 20, 2016].
- United States Bureau of Economic Analysis. 2015. Regional Data. Available at: <http://www.bea.gov/iTable/iTable.cfm?reqid=70&step=1&isuri=1&acrdn=7#reqid=70&step=25&isuri=1&7022=49&7023=7&7024=non-industry&7001=749&7029=49&7090=70> [Accessed on December 11, 2015]
- United States Census Bureau. 2015. 2010-2014 American Community Survey 5-Year Estimates. Available at: [http://factfinder.census.gov/faces/nav/jsf/pages/community\\_facts.xhtml](http://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml) [Accessed on December 11, 2015].
- United States Department of Agriculture. 2003-2015. USDA's National Agricultural Statistics Service County Ag Commissioners' Data Listing. Available at: [http://www.nass.usda.gov/Statistics\\_by\\_State/California/Publications/AgComm/Detail/](http://www.nass.usda.gov/Statistics_by_State/California/Publications/AgComm/Detail/) [Accessed on November 12, 2015].
- \_\_\_\_\_. 2013. Summary Report: 2010 National Resources Inventory. Natural Resources Conservation Service, Washington, D.C, and Center for Survey Statistics and Methodology, Iowa State University, Ames, Iowa. Available at: [http://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb1167354.pdf](http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1167354.pdf). [Accessed on January 12, 2016].

- USDA NRCS. 2009a. Web Soil Survey, *Custom Soil Resource Report for Colusa County*. Surface Texture, Colusa County, California. Version 7, August 27, 2009.
- \_\_\_\_\_. 2009b. Web Soil Survey, *Custom Soil Resource Report for Sutter County*, Surface Texture, Sutter County, California. Version 7, August 31, 2009.
- \_\_\_\_\_. 2009c. Farm and Ranchlands Protection Program. Programmatic Environmental Assessment. January 2009. Available at: [http://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb104234\\_0.pdf](http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb104234_0.pdf) [Accessed on January 19, 2016].
- \_\_\_\_\_. 2011. Web Soil Survey, *Custom Soil Resource Report for Glenn County*, Surface Texture, Glenn County, California. Version 7, December 19, 2011.
- \_\_\_\_\_. 2012. Web Soil Survey, *Custom Soil Resource Report for Yolo County*, Surface Texture, Yolo County, California. Version 7, December 12, 2007.
- United States Environmental Protection Agency. 2015a. The Green Book Nonattainment Areas for Criteria Pollutants. Available at: <http://www.epa.gov/oaqps001/greenbk/> [Accessed on January 12, 2016].
- \_\_\_\_\_. 2015b. Emissions & Generation Resource Integrated Database (eGRID2012) Summary Tables. Available at: [http://www.epa.gov/sites/production/files/2015-10/documents/egrid2012\\_summarytables\\_0.pdf](http://www.epa.gov/sites/production/files/2015-10/documents/egrid2012_summarytables_0.pdf) [Accessed on January 12, 2016].
- United States Fish and Wildlife Service (USFWS). 2015a. Reinitiation of Programmatic Formal Consultation for Bureau of Reclamation's Proposed Central Valley Project Long Term Water Transfers (2015-2024) with Potential Effects on the Giant Garter Snake within Sacramento Valley, California
- \_\_\_\_\_. 2015b. Species Listed in California. Available at: [http://ecos.fws.gov/tess\\_public/reports/species-listed-by-state-report?state=CA&status=listed](http://ecos.fws.gov/tess_public/reports/species-listed-by-state-report?state=CA&status=listed) [Accessed on January 19, 2015].
- University of California - Cooperative Extension (UCCE). 2012. Sample Costs to Produce Rice, Sacramento Valley, Rice Only Rotation. Available at: <http://coststudies.ucdavis.edu> [Accessed on January 26, 2015].
- Yolo County. 2012. Final Environmental Impact Report on the Environmental Education and Sustainability Park. Available at:

<http://www.yolocounty.org/home/showdocument?id=20521>. See page 3.6-4. [Accessed on January 13, 2016].

Yolo-Solano Air Quality Management District. 2007. *Handbook for Assessing and Mitigating Air Quality Impacts*. July 11. Available at: <http://www.ysaqmd.org/documents/CEQAHandbook2007.pdf> [Accessed on January 12, 2016].

Zeiner, D. C., W., F. Laudenslayer, Jr., K. E. Mayer, M. White. Editors. 1990. *California's Wildlife*. Volume 2. Birds. State of California, Department of Fish and Game. Sacramento, California. 731 pp.