FILED
YOLO COUNTY CLERK/RECORDER
MAY - 3 2011
FREDDIE OAKLEY, CLERK
BY KRISTINA HUNT
DEPUTY

Notice of Determination

To: x Office of Planning and Research
1400 Tenth Street, Room 121
Sacramento, CA 95814

X County Clerk
County of Yolo
625 Court Street, Room B01
Woodland, CA 95695

From: Woodland-Davis Clean Water Agency
c/o Davis Public Works
1717 5th Street
Davis, CA 95616
(530)757-5673

CERTIFIED COPY
NOT COMPARED
WITH ORIGINAL

Subject: **Filing of Notice of Determination in compliance with Section 21108 or 21152 of the Public Resources Code.**

State Clearinghouse Number (if submitted to State Clearinghouse): 2006042175

Project Title: Davis-Woodland Water Supply Project ("DWWSP")

Project Location: Yolo County (see 2007 DWWSP EIR for more-detailed description)

Project Description: Sacramento River diversion, conveyance pipelines, water treatment plant and distribution pipelines (see 2007 DWWSP EIR for more-detailed project description).

This is to advise that on April 21, 2011, the Woodland-Davis Clean Water Agency ("WDCWA"), acting as CEQA lead agency, approved an addendum to the EIR for the DWWSP that the City of Davis (then acting as CEQA lead agency) certified on October 16, 2007. In its Resolution No. 2011-03, WDCWA approved this addendum and found and determined that, considering the changes in the regulatory setting and the DWWSP that are described in the addendum, the 2007 EIR remains adequate and no subsequent EIR or further CEQA review is required for the DWWSP.

This is to certify that copies of WDCWA Resolution No. 2011-03 and the approved CEQA addendum are available to the General Public at: Woodland-Davis Clean Water Agency, c/o Davis Public Works, 1717 5th Street, Davis, CA 95616.

Eric Mische — May 3, 2011

Signature, Eric Mische, General Manager, Woodland-Davis Clean Water Agency — *Date*

530-747-8299

Date received for filing at OPR:

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MAY - 5 2011
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POSTED MAY - 3 2011 TO

N11-29

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Eric Mische — April 29, 2011

Signature, Eric Mische, General Manager, Woodland-Davis Clean Water Agency — *Date*

530-747-8299

Date received for filing at OPR:

POSTED MAY - 3 2011 TO JUN - 3 2011

N11-29

RESOLUTION NO. 2011-03

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE WOODLAND-DAVIS CLEAN WATER AGENCY APPROVING CEQA ADDENDUM TO PROJECT FINAL EIR AND MAKING RELATED FINDINGS

WHEREAS, in 2007, prior to formation of the Woodland-Davis Clean Water Agency ("Agency"), the City of Davis certified the Davis-Woodland Water Supply Project Final Environmental Impact Report ("Final EIR") and the Cities of Davis and Woodland approved the Project;

WHEREAS, the Cities of Davis and Woodland approved a Joint Powers Agreement forming the Agency in 2009, in order for the Agency to pursue the development of the Davis-Woodland Water Supply Project ("Project") and, pursuant to the Joint Powers Agreement, the Agency has assumed the California Environmental Quality Act ("CEQA") lead agency role for the Project;

WHEREAS, since certification of the Final EIR, there have been changes in the regulatory setting for Delta water and aquatic resources as well as minor refinements to one element of the Project involving the water right purchase agreement between the Agency and Conway Preservation Group ("CPG");

WHEREAS, in light of these regulatory setting and minor project changes, the Agency has prepared an Addendum to the Final EIR ("Addendum") pursuant to CEQA Guidelines section 15164 to evaluate whether these changes result in new significant impacts beyond those already identified and mitigated for in the Final EIR or result in substantially more severe impacts than disclosed in the Final EIR; and,

WHEREAS, the Addendum prepared by Agency environmental consultants and staff concludes that "the changes in the regulatory framework for Delta water and aquatic resources as well as the minor revisions to one element of the proposed project (number and locations of CPG groundwater wells) will not result in any new or more severe impacts than those discussed in the 2007 DWWSP EIR. None of the conditions or circumstances that would require preparation of a subsequent or supplemental EIR pursuant to Public Resources Code Section 21166 exists in connection with the proposed project with these changes."

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of Woodland-Davis Clean Water Agency as follows:

1. The Board confirms and ratifies that, pursuant to the 2009 Joint Powers Agreement, the Agency has assumed the CEQA lead agency role for the Project.

2. The Board approves the Addendum in the form presented at this meeting.

3. The Board has reviewed and considered the Addendum in light of the 2007 Final EIR.

4. In accordance with Public Resources Code section 21166 and CEQA Guidelines section 15162, and based on the Final EIR and Addendum, the Board finds and determines as follows:

a. The potential environmental effects of the Project have been analyzed, considered and mitigated through the Final EIR.

b. In the Addendum, the Agency has evaluated and considered the changes in the regulatory setting for Delta water and aquatic resources as well as minor refinements to one element of the Project as compared with the Project approved in 2007. The regulatory setting changes and Project changes analyzed in the Addendum do not involve new significant environmental effects or a substantial increase in the severity of previously identified significant effects, and the changes with respect to the Project circumstances do not involve new significant environmental effects or a substantial increase in the severity of previously identified significant effects.

c. The Agency is not aware of any other new information of substantial importance that discloses that the Project will have other or more severe significant environmental effects not previously discussed or that previously rejected or other mitigation measures or alternatives are now feasible and effective.

d. Therefore, the Final EIR remains adequate and no subsequent EIR or further CEQA environmental analysis is required for the Project.

5. The Board authorizes and directs the General Manager and his designees to continue processing the WDCWA/CPG water right purchase agreement transaction and to otherwise carry forward with implementation of the Project.

6. The Board authorizes and directs the General Manager to prepare and file a CEQA Notice of Determination reflecting this determination.

PASSED AND ADOPTED by the Board of Directors of the Woodland-Davis Clean Water Agency on this 21st day of April 2011 by the following vote:

AYES: **KROVOZA, DOTE, SOUZA, MARBLE**
NOES: **NONE**
ABSTAIN: **NONE**
ABSENT: **NONE**

By: _____
William Marble, Chair

Attest:

_____
Lynanne Mehlhaff, Secretary

DAVIS-WOODLAND WATER SUPPLY PROJECT

Environmental Impact Report Addendum
SCH # 2006042175

Prepared for
Woodland Davis Clean Water Agency

April 2011

ESA

DAVIS-WOODLAND WATER SUPPLY PROJECT

Environmental Impact Report Addendum
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Prepared for
Woodland Davis Clean Water Agency

April 2011

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210676

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List of Acronyms

af – Acre-Feet
af/yr – Acre-Feet Per Year
BA – Biological Assessment
CEQA – California Environmental Quality Act
CPG – Conaway Preservation Group
CVP – Central Valley Project
Delta – Sacramento San Joaquin Delta
DFG – California Department of Fish and Game
DPM – Diesel Particulate Matter
DWR – Department of Water Resources
DWWSP – Davis Woodland Water Supply Project
EIR – Environmental Impact Report
JPA – Joint Power Authority
NOP – Notice of Preparation
NMFS – National Marine Fisheries Service
OCAP – Operations and Criteria Plan
RD 2035 – Reclamation District 2035
Reclamation – United States Department of the Interior, Bureau of Reclamation
SCH – State Clearinghouse
SWP – State Water Project
SWPPP – Stormwater Pollution Prevention Program
SWRCB – State Water Resources Control Board
TAF/yr – Thousand Acre-Feet Per Year
UC Davis – University of California, Davis
USFWS – United States Fish and Wildlife Service
WDCWA – Woodland Davis Clean Water Agency
WTP – Water Treatment Plant

SECTION 1
Background and Purpose of this Addendum

1.1 Background

The Cities of Davis, Woodland, and the University of California, Davis (UC Davis) (Project Partners) proposed to implement the Davis Woodland Water Supply Project (DWWSP or proposed project). The proposed project involves development of a new surface water supply for the Project Partners and consists of: an intake/diversion structure on the Sacramento River, a conveyance pipeline between the intake/diversion structure and a new regional water treatment plant, and distribution pipelines conveying treated surface water from the water treatment plant to each of the three Project Partners. Other local improvements such as distribution pipelines and storage facilities will be required by each Project Partner. The project also includes acquisition of a new water right permit for the diversion and use of surface water from the Sacramento River and one or more water transfers to authorize the DWWSP to divert water during periods when surface water diversions from the Sacramento River under the DWWSP's water right permit will be prohibited.

With the City of Davis as the lead agency, the Project Partners prepared an Environmental Impact Report (EIR) on the DWWSP (State Clearinghouse (SCH) # 2006042175) in accordance with the requirements of the California Environmental Quality Act (CEQA). The Notice of Preparation (NOP) for the EIR was published on April 28, 2006 and circulated to the public, local, state and federal agencies, and other interested parties. In addition to the 45-day public and agency comment period, public scoping sessions were held on May 18, 2006 in Woodland and May 22, 2006 in Davis. The Draft EIR was published on April 9, 2007 and circulated for public and agency review for a 76-day public review period ending June 25, 2007. Two public meetings on the Draft EIR were held by City of Davis on April 23 and May 2, 2007 and one public meeting was held by the City of Woodland on May 16, 2007. On October 16, 2007, the City of Davis, as acting CEQA lead agency, adopted Resolution No. 07-168, Series 2007, which certified the final EIR, adopted CEQA findings, a statement of overriding considerations and a mitigation monitoring and reporting program, and approved the DWWSP. On November 6, 2007, the City of Woodland, acting as a CEQA responsible agency, adopted Resolution No. 4878, which adopted CEQA findings and the mitigation monitoring and reporting program and approved the DWWSP.

Since the certification of the EIR, the Cities of Woodland and Davis have formed the Woodland Davis Clean Water Agency (WDCWA), a joint powers authority (JPA), to implement the DWWSP. WDCWA has proceeded with implementation of the DWWSP, including additional project planning in preparation of the engineering design and project construction phases, financial planning, and acquisition of project permits and approvals. On March 1, 2011, the State Water Resources Control Board (SWRCB) adopted water-right Decision 1650 (Decision 1650), which approved WDCWA's

applications for a water right permit for the DWWSP and directed the issuance of a permit on these applications. On April 14, 2011 and following Decision 1650, the SWRCB's Division of Water Rights issued water-right Permit 20281 to WDCWA. This permit authorizes the WDCWA to divert up to 45,000 acre-feet of surface water per year from the Sacramento River for the DWWSP, subject to the SWRCB's Standard Permit Term 91, which prohibits diversions during times when the satisfaction of inbasin entitlements requires the release of supplemental water by the Central Valley Project (CVP) or State Water Project (SWP). Permit 20281 also contains other terms and conditions to require the WDCWA to comply with the DWWSP EIR's mitigation measures and California Department of Fish and Game (DFG) requirements.

Since certification of the Final DWWSP EIR in 2007, there have been changes in the regulatory setting for Delta water and aquatic resources as well as minor refinements to an element of the DWWSP involving the proposed water transfer from the Conway Preservation Group (CPG) to the DWWSP. The revisions to this project element involve changes in the number and locations of the proposed groundwater wells on the CPG property that will support (along with other CPG existing wells) the proposed assignment of some of CPG's water rights to the WDCWA.

As a result of these regulatory setting and minor project changes, the WDCWA, acting now as the CEQA lead agency for the DWWSP, has prepared this Addendum to the 2007 EIR. Section 2 of this document describes the relevant changes in regulatory framework and the project refinements in more detail. Section 3 of this document evaluates the environmental effects of these regulatory and project changes in comparison to the impacts analyzed in the 2007 DWWSP EIR. The overall conclusions are presented in Section 3.4.

1.2 Purpose of the EIR Addendum

According to Section 15164(a) of the CEQA Guidelines, the lead agency or a responsible agency shall prepare an addendum to a previously certified EIR if some changes or additions are necessary but none of the conditions described in Section 15162 requiring preparation of a subsequent EIR have occurred. Section 15162 of the Guidelines lists the conditions that would require the preparation of a subsequent EIR rather than an addendum. These include the following:

1. Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;
2. Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or
3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time of the previous EIR was certified as complete or the negative declaration was adopted, shows any of the following:
    a. The project will have one or more significant effects not discussed in the previous EIR or negative declaration;
    b. Significant effects previously examined will be substantially more severe than shown in the previous EIR;

c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

This Addendum documents that the changes in the regulatory framework for Delta water and aquatic resources and the minor revisions to an element of the proposed project (the number and locations of CPG's proposed new groundwater wells) do not trigger any of the Section 15162 conditions described above, and that the preparation of an addendum therefore is appropriate.

SECTION 2
Description of Regulatory and Project Changes

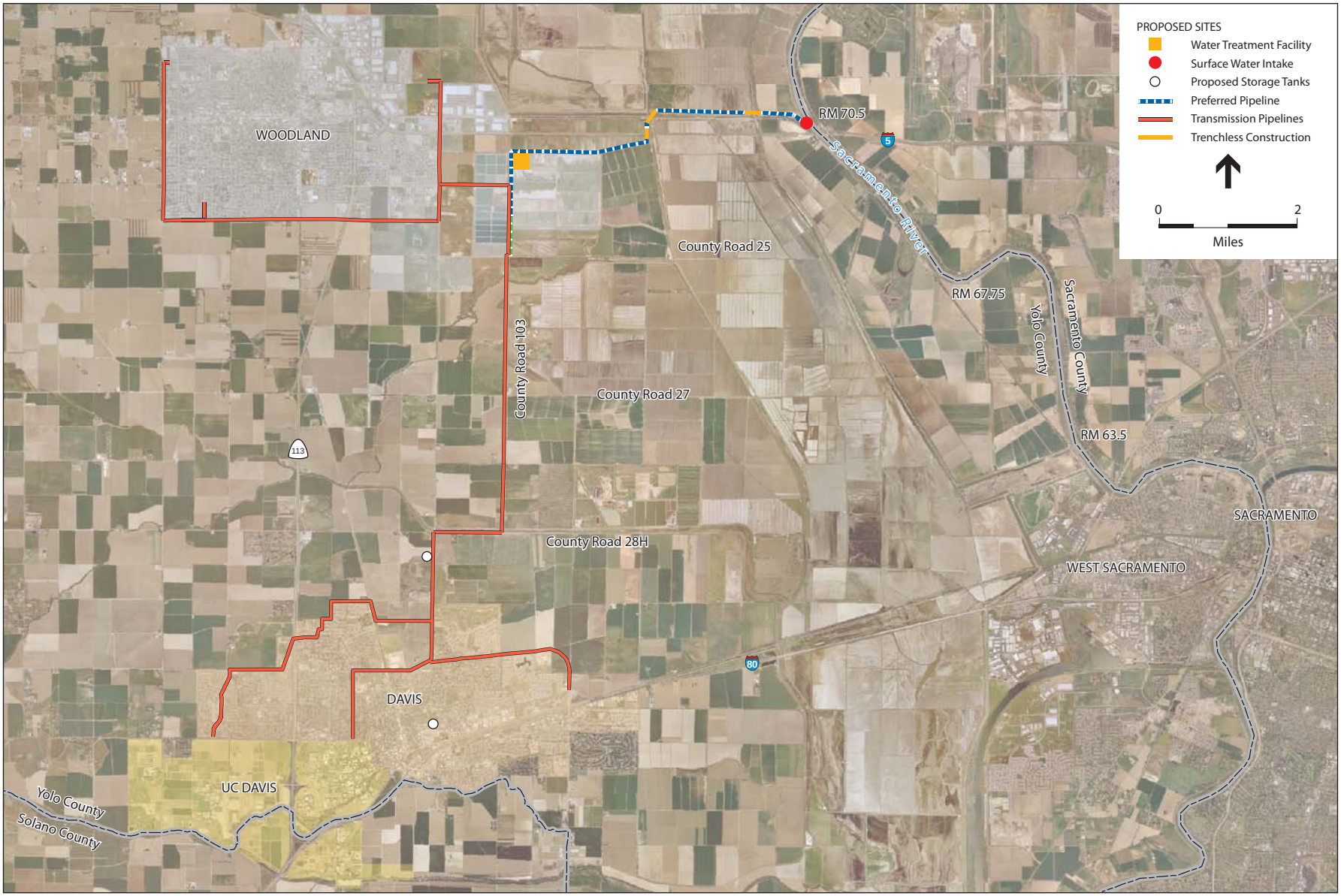
2.1 Project Overview

The DWWSP involves development of a new surface water supply for the Project Partners and consists of: an intake/diversion structure on the Sacramento River, a conveyance pipeline between the intake/diversion structure and a new regional water treatment plant, and distribution pipelines conveying treated surface water from the water treatment plant to each of the three Project Partners. Other local improvements such as distribution pipelines and storage facilities will be required by each Project Partner. The project also includes acquisition of a new water right permit for the diversion and use of surface water from the Sacramento River and one or more water transfers to authorize the DWWSP to divert water during periods when surface water diversion from the Sacramento River under the DWWSP's water right permit will be prohibited. The DWWSP is designed to address the water supply needs of the Project Partners through 2040.

Figure 1 shows the layout of the proposed project as analyzed in the 2007 DWWSP EIR. The approved project is described in Chapter 2 of the 2007 DWWSP EIR. The EIR evaluated three options for the intake/diversion structure. The preferred option, approved by Davis and Woodland, is joint use of the replacement intake proposed for construction by Reclamation District 2035 (RD 2035) and the Project Partners, as shown on Figure 1. The EIR also evaluated six potential transfers from holders of senior water rights that might be willing to enter into water transfer agreements to provide surface water to the project. Such a supplemental supply is needed to augment the surface water supply that will be available for diversion and use water right Permit 20281 because there are periods when diversions under that permit will be prohibited and the project will need an alternative surface water supply during these periods to maintain the project's water supply.

In December 2010, the WDCWA and CPG executed a water agreement that provides for the assignments of parts of CPG's water rights to WDCWA. CPG is one of the six holders of senior water rights for which potential water transfers to the DWWSP were analyzed in the EIR.[1]

[1] The 2007 DWWSP EIR analyzed a proposed long-term or permanent transfer of water from CPG to the DWWSP. Under this proposed transfer, CPG would have retained title to the water rights that were used for the transfer. The December 2010 WDCWA/CPG Water Agreement instead provides for a permanent assignment to the WDCWA of the parts of CPG's water rights that are necessary for the WDCWA to be authorized to divert up to 10 TAF/yr of water under these rights. With this assignment, the WDCWA will hold title to these water rights. For purposes of the analysis of potential environmental impacts in this addendum, there are no differences between the proposed permanent transfer of water from CPG to the DWWSP that is described in the 2007 EIR and the proposed water rights assignment in the December 2010 WDCWA/CPG Agreement.



SOURCE: GlobeXplorer, 2006; West Yost & Associates, 2006; and ESA, 2006

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Figure 1

2007 DWWSP Final EIR Figure 1-3 - Preferred Project

2.2 Changes in Regulatory Framework for the Delta and CALSIM II Hydrological Modeling

Since the certification of the 2007 DWWSP EIR, changes have occurred in the regulatory framework affecting the water resources and aquatic resources of Sacramento River and Sacramento-San Joaquin Delta (Delta) and the state and federal water supply operations in the Delta. Various actions have revised the flow criteria for the Delta and its tributaries that apply to the CVP and SWP and modified terms and conditions that apply to CVP and SWP diversions of water from the Delta. These actions include the United States Department of the Interior, Fish and Wildlife Service (USFWS) Biological Opinion for delta smelt issued in December 2008, and the National Marine Fisheries Service (NMFS) Biological Opinion for salmonids issued in June 2009.

To address these changes in the regulatory framework and the reduction in projected maximum DWWSP demand from 56,717 to 46,136 acre-feet per year (af/yr)[2], the WDCWA had an updated hydrological analysis of potential DWWSP effects on Delta water resource and aquatic resources prepared by its hydrological consultant, Walter Bourez (MBK Engineers). The most up-to-date regulatory requirements were integrated into the CALSIM II model and the proposed DWWSP operations were re-analyzed using the updated model to assess potential effects of the DWWSP on Delta water resources, aquatic resources and other water users. This updated analysis was submitted to the SWRCB for the hearing that ultimately resulted in Decision 1650. **Appendix A** to this Addendum contains a copy of the written testimony that Mr. Bourez prepared for this SWRCB hearing. This written testimony describes the updated CALSIM II modeling analysis that Mr. Bourez conducted for this hearing. **Appendix B –** contains a copy of the written testimony that Dr. Charles H. Hanson and provides additional analysis of the updated CALSIM II modeling as it relates to fisheries resources. This analysis is discussed in Section 3.0 below. It describes the potential effects of DWWSP based on hydrological modeling that includes these regulatory changes compared to the impact analysis presented in the 2007 DWWSP EIR. A full list of exhibits for the City of Davis and Woodland SWRCB water rights application hearing can be found at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/hearings/daviswoodland/

2.3 Changes in the Proposed CPG Water Transfer

The 2007 DWWSP EIR describes a water transfer under which CPG would make surface water available to the DWWSP by implementing a groundwater substitution program, under which CPG would increase its groundwater pumping to meet more of its agricultural irrigation needs and thereby free up a portion of its surface water supply for transfer to the DWWSP. The EIR analyzed a transfer of up to 10 thousand acre-feet/year (TAF/yr) from CPG to the DWWSP. To

[2] The reduction in overall water demand for the DWWSP from 56,717 AF/yr to 46,136 AF/yr was correctly described as the proposed maximum annual DWWSP diversion in the 2007 DWWSP EIR. Because the CALSIM II modeling already had been conducted with the higher 56,717 AF/yr estimated maximum annual diversion before the 2007 DWWSP EIR was prepared, and because using this higher annual maximum diversion amount in the water and aquatic resources impact analysis overestimated the DWWSP's impacts that were described in the EIR, this modeling was not redone for the 2007 DWWSP EIR.

implement this transfer, CPG would operate either existing groundwater wells or construct and operate additional groundwater wells to provide replacement water supplies for CPG's use.

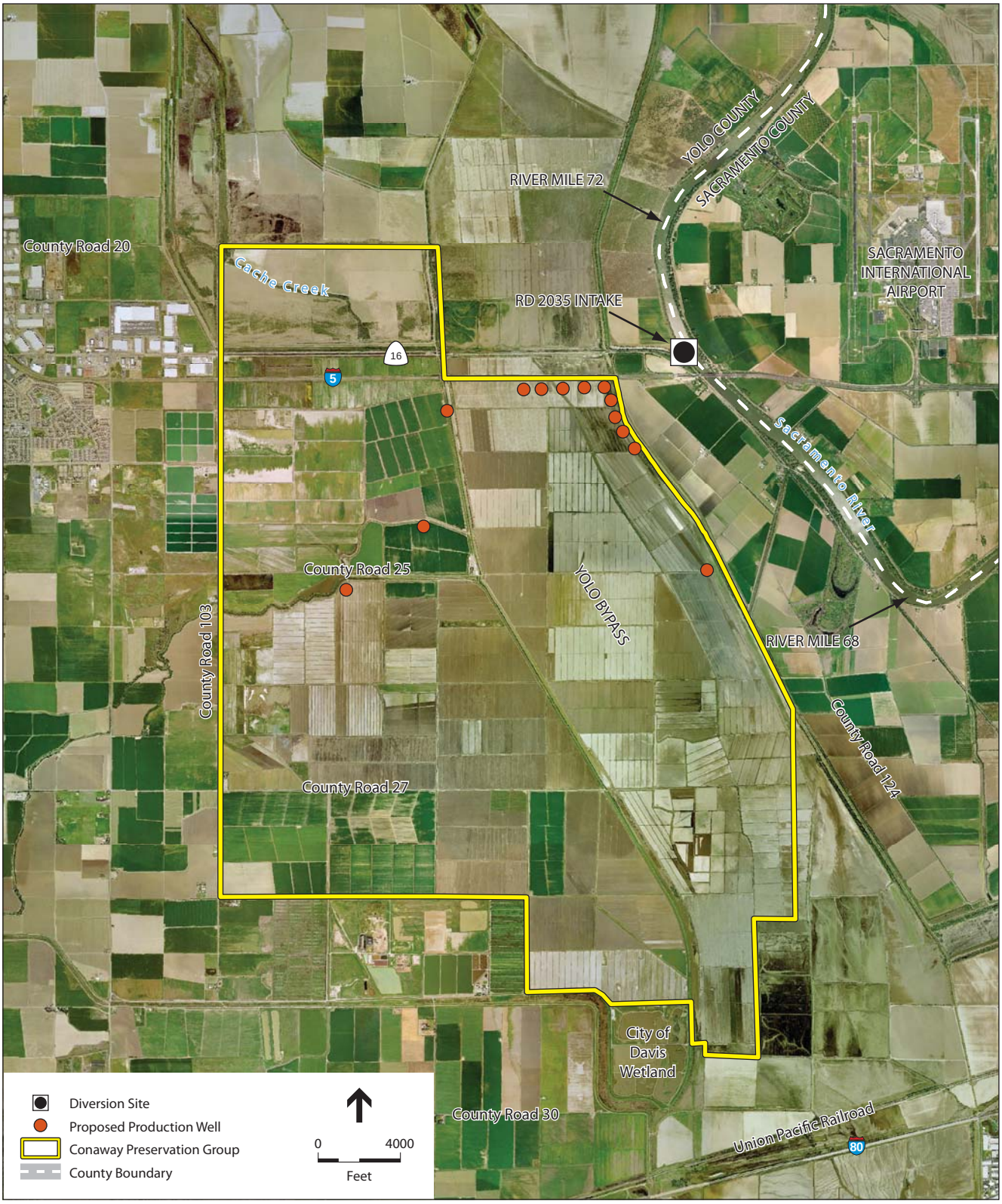
The 2007 DWWSP EIR stated that a combination of 18 existing and new groundwater wells would be operated over a period of about six months each year to produce 10 TAF/yr of substitute agricultural water supplies for CPG. Thirteen existing wells were identified in the EIR (**Figure 2**). Since EIR certification, CPG has revised the number and locations of the proposed additional groundwater wells that it will construct to support both the proposed transfer of surface water to WDCWA and its own updated plans for management of its agricultural activities. The locations of the proposed new groundwater wells are shown in **Figure 3**.

Conaway Ranch currently operates 23 groundwater production wells with a total pumping capacity of approximately 7,000 acre-feet per month (Figure 3). Over half of these wells are located near the Conaway Ranch Cross Canal or within the Yolo Bypass, which both are west of the Sacramento River. The remaining wells are located in the central portion of Conaway Ranch near the Conaway Main Canal or Willow Slough (Figure 3). Conaway Ranch operates these existing groundwater wells to supplement the available surface water supplies, particularly during June through September.

As part of its ongoing agricultural operations, CPG is in the process of constructing 10 additional groundwater wells. Eight of these wells are planned to be located west of the Conaway Main Canal and two of these wells are planned to be located adjacent to and east of the Conaway Main Canal. These ten new wells are planned to be located between approximately 2.1 miles and 5.7 miles from the Sacramento River (Figure 3). The new wells will be constructed by the fall of 2011 and will supplement CPG's existing groundwater and surface water supplies for crop irrigation and other farming activities.

Each new groundwater well is currently estimated to produce approximately 500 acre-feet (af) of groundwater per month during peak water demand periods (i.e., June through September). Final determination of the size and estimated capacity of each well will be based on the results of drilling and pumps tests that will determine soil and aquifer suitability and productivity. These tests will also provide information for determining the depths at which the wells will be perforated. Development of each groundwater well will disturb an area of approximately 900 square feet for concrete pads, wells and piping (9,000 square feet for all 10 wells). Therefore, a total of 0.21 acre of ground disturbance is anticipated for the ten new groundwater wells.

In general, the new groundwater wells will be sited in areas where there are no known constraints such as unsuitable soils, presence of wetlands or other sensitive habitat, or limited access by vehicles. However, the final site selection will be determined based on the results of test drilling.



SOURCE: Bureau of Reclamation, 2001; ESRI, 2005; GlobeXplorer, 2006; and ESA, 2006

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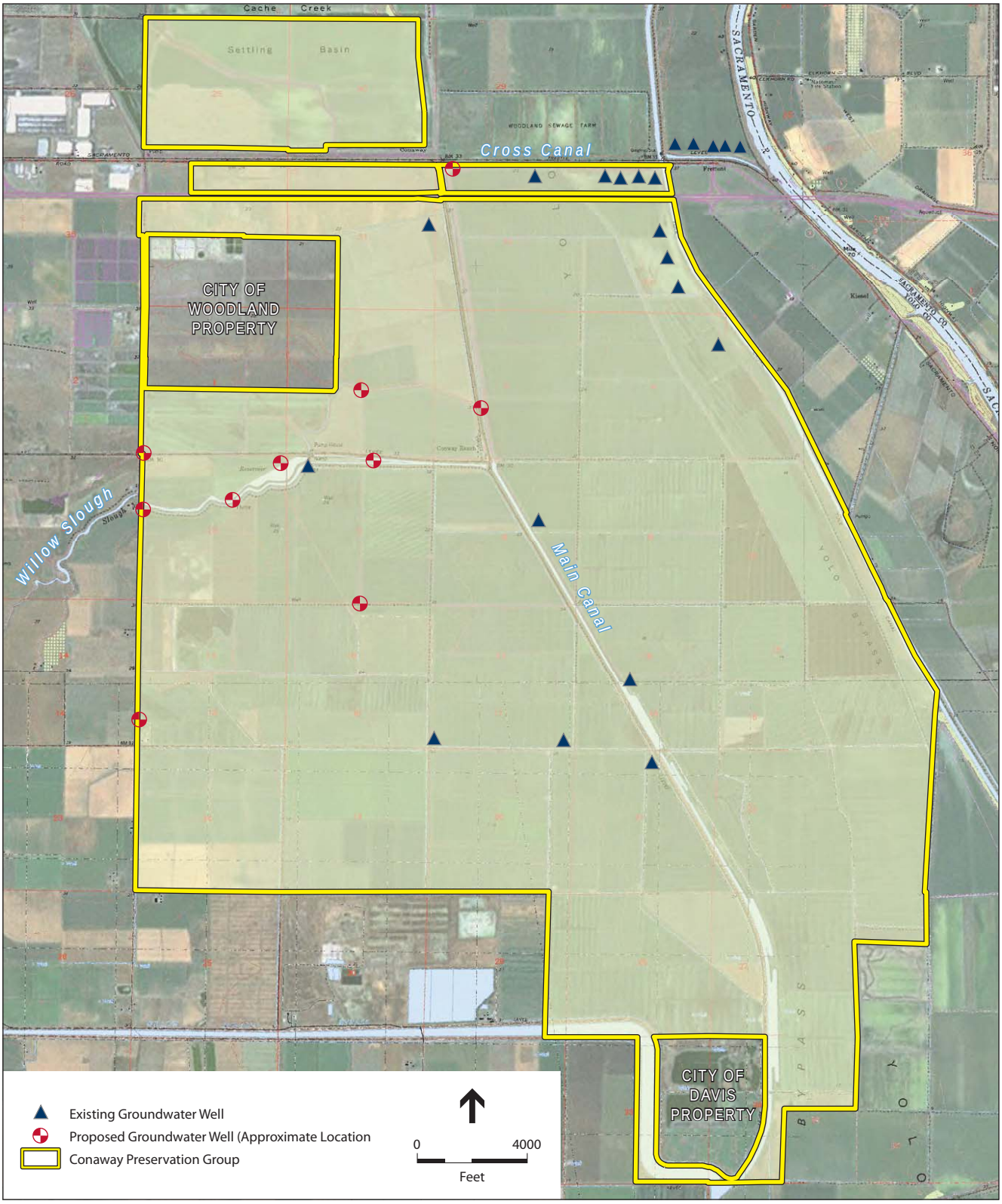
Figure 2

2007 DWWSP EIR Figure 2-19 - Conaway Preservation Group



SOURCE: MBK Engineers, 2011; and ESA, 2011

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Figure 3

Conaway Preservation Group - 2011 Updated Groundwater Well Plan

SECTION 3
Analysis of Potential Environmental Effects

3.1 Introduction

The 2007 DWWSP EIR evaluated the following environmental issues: surface and groundwater resources, hydrology and water quality, land use and agriculture, geology, soils, and seismicity, air quality, noise, hazards and hazardous materials, public health, transportation, public services and utilities, cultural resources, recreation, aesthetics, growth inducing effects, and cumulative effects. These issues are re-evaluated in this addendum in light of the changes in Delta regulatory requirements and the changes that have occurred to the proposed project. This evaluation determines whether, with these changes, implementation of the proposed project will result in any new significant impacts or substantially more severe impacts than identified in the 2007 DWWSP EIR. The 2007 DWWSP EIR (Section 3.0, Environmental Analysis) describes the criteria that were used to determine the significance of environmental impacts. All mitigation measures identified in the 2007 DWWSP were subsequently adopted by the DWWSP Partners as conditions of project approval. All applicable measures also will apply to the project changes described in this addendum.

The analysis contained in this addendum is focused on the selected project facilities and resource areas that may be affected by the proposed changes in the Delta regulatory framework and to the project. The changes in the regulatory environment affecting the Delta are relevant only to the assessments of the DWWSP's potential impacts on surface water resources and associated biological resources. The changes to the number and locations of proposed wells to be construction by CPG to support the assignment of parts of CPG's water rights to WDCWA are relevant only to the site specific construction impact issue areas addressed in the 2007 DWWSP EIR for the CPG groundwater substitution transfers. For this reason, all other DWWSP facilities, including the joint intake, the water treatment plant (WTP), raw and treated water distribution pipelines, storage tanks and other ancillary facilities, remain unchanged from the 2007 DWWSP EIR and therefore are not discussed further in this addendum.

3.2 Effects Related to Changes in Regulatory Framework for the Delta

Table 1 identifies the potential impacts and conclusions for surface water hydrology and water quality and for biological resources, including fisheries biological resources, as analyzed in the 2007 DWWSP EIR. The 2007 DWWSP EIR concluded that the DWWSP would not have any significant impacts on hydrology and water quality or fisheries biological resources. These potential impacts are re-evaluated below to determine whether the changes in the regulatory environment

affecting the Delta since certification of the EIR would result in any new significant impacts or substantially more severe impacts than those analyzed in the 2007 DWWSP EIR.

TABLE 1
SUMMARY OF IMPACTS TO SURFACE WATER HYDROLOGY/WATER QUALITY AND FISHERIES BIOLOGICAL RESOURCES FROM THE 2007 DWWSP EIR

SECTION 3.2. SURFACE WATER HYDROLOGY AND WATER QUALITY		
Impact 3.2-1.	Violate water quality standards or waste discharge requirements.	NI
Impact 3.2-2.	Adversely affect Sacramento River hydrologic conditions or Delta inflow and/or outflow	LS
Impact 3.2-3.	Substantially degrade water quality of the Sacramento River or Delta.	LS
Impact 3.2-4.	Infringe upon the water rights of other legal users of water.	NI
SECTION 3.6. BIOLOGICAL RESOURCES		
Impact 3.6-1:	Interfere substantially with the movement, corridors and wildlife nursery sites.	LSM
Impact 3.6-2:	Conflict with any local policies or ordinances protecting biological resources	LSM
Impact 3.6-3:	Conflict with the provisions of an adopted habitat conservation plan.	NI
Impact 3.6-4:	Substantial adverse effect on fish or other aquatic species	LSM
Impact 3.6-5:	Adversely affect the behavior, movement, and local distribution of special-status fish.	LS
Impact 3.6-6:	Entrainment and/or impingement mortality of special-status fish or other aquatic species.	LS
Impact 3.6-7:	Substantial adverse effects on any species identified as a candidate, sensitive, or special-status species	LSM
Impact 3.6-8:	Substantial adverse affects on riparian habitat or other sensitive natural communities	LSM
Impact 3.6-9:	Substantial adverse effects on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.)	LSM

Source: DWWSP 2007 EIR

Surface Water Hydrology and Water Quality

Section 3.2 of the 2007 DWWSP EIR concluded that implementation of the proposed project would result in less than significant impacts to surface water hydrology and water quality. To analyze the potential effects of the project on CVP and SWP upstream reservoir storage levels, reservoir releases, Sacramento River in-stream flows, Delta flows, water quality, and Delta export operations, the Department of Water Resources (DWR) and United States Department of the Interior, Bureau of Reclamation (Reclamation) CALSIM II model was used. The results of the CALSIM II modeling conducted for the 2007 DWWSP EIR indicate that, during periods of the year when the proposed project would be diverting water from the Sacramento River under its own water right permit (that is, when Term 91 would not be in effect), DWWSP diversions would equal about 0.3 percent to 0.5 percent of the total Sacramento River flow. The maximum decrease in average annual Sacramento River flow would be 82 cfs and the DWWSP would result in average annual decrease in Sacramento River flow of approximately 0.4 percent.

During late-spring and summer months, when Term 91 normally is in effect, the proposed project would not divert water from the Sacramento River under its own water right permit. During these conditions, the proposed project would only divert from the Sacramento River water that was being transferred to the DWWSP from upstream senior water rights holders. As a result, the proposed project would not reduce the flows in the Sacramento River that would otherwise occur during this period.

With respect to Delta inflows and outflows, the CALSIM II modeling conducted for the 2007 DWWSP EIR indicated that the proposed project would result in an average annual decrease in Delta inflow of approximately 65 TAF/yr or 0.3 percent of the total average annual Delta inflow, and a decrease in annual Delta outflow of approximately 27 TAF/yr or 0.2 percent of the total average annual Delta outflow. The 2007 DWWSP EIR concluded that these changes would be minor in comparison to natural hydrological variability that would be expected to occur and would not conflict with other water management objectives, such as CVP and SWP reservoir storage, quality, and temperature, would not interfere with any senior water rights, and would not adversely impact any beneficial uses within the Sacramento River and Delta.

At the time of the certification of the 2007 DWWSP EIR, the proposed project analysis was based on the CALSIM II studies conducted for the CVP 2004 Operations Criteria and Plan (OCAP) and OCAP biological assessment (BA). Reclamation released the OCAP BA CALSIM II studies in February 2004, with revisions in June 2004. After the certification of the 2007 DWWSP EIR, new regulatory restrictions were imposed on CVP/SWP operations, which established new flow criteria for the Delta and its tributaries and new conditions on CVP and SWP exports from the Delta. These restrictions include the USFWS Biological Opinion for delta smelt issued in December 2008 and the NMFS Biological Opinion for salmonids issued in June 2009. The updated CALSIM II modeling that Mr. Bourez conducted for the SWRCB hearing that ultimately led to Decision 1650 reflects these changes. As with the 2007 DWWSP EIR, the updated CALSIM II modeling compared, for each month of the 82 year period, the estimated Sacramento River flows at Freeport under existing conditions with and without the proposed project operations, and has similar comparative analyses for anticipated future conditions.

Results of the updated CALSIM II modeling show that, on average, the proposed project will change Sacramento River flows at Freeport under existing conditions by amounts varying from an increase of 19 cfs (in September) to a reduction of 80 cfs (in October), with the majority of the changes being reductions in the range of approximately 25 to 60 cfs. Results of the analysis for anticipated future conditions are similar, with estimated average overall flow reductions in the Sacramento River at Freeport ranging from 1 cfs (in July) to 68 cfs (in May), and with typical reductions in flows within the range of approximately 25 to 70 cfs. The monthly variations were greater under both current and future conditions for individual months and water year types (see Appendix A, Exhibit WDCWA-102, p.11; Exhibit WDCWA-103, p.11**)**.

Expressing the modeled changes in Sacramento River flows at Freeport with and without the proposed project as percentages of river flows shows the relative magnitudes of the average changes in instream flows. Results of these analyses are summarized in Appendix B, Exhibit WDCWA-212 for both current and future conditions. Results of these analyses show that the magnitude of changes in the Sacramento River flows is consistently less than 1 percent, with the majority of changes being within the range from -0.1 to -0.2 percent, under both current and future conditions.

Results of the updated modeling of the estimated effects of the proposed project diversions on Delta outflows under existing conditions **(**Appendix A, Exhibit WDCWA-102, p.5**)** and cumulative future conditions **(**Appendix A, Exhibit WDCWA-103, p.5**)** show, that on average, the project will

cause small reductions (35 cfs of less) in flows within the Delta. Results of the analysis, summarized for all water years, show that reduction in Delta outflow will be 0.3 percent or less in all months (Appendix B, Exhibit WDCWA-215).

The CALSIM II modeling results contained within Exhibits WDCWA-102 and WDCWA-103 in Appendix A demonstrate that the updated modeled effects of DWWSP diversions under the WDCWA's water-right permit will be very similar to the modeled effects described in the 2007 DWWSP EIR. These exhibits therefore conclude that the proposed project, with the changes in the regulatory environment affecting the Sacramento River and Sacramento-San Joaquin Delta that have occurred since the certification of the 2007 DWWSP EIR, will result in no impacts to water quality standards or waste discharge requirements and will not infringe upon the water rights of other legal users of water. Additionally, the proposed project will have less than significant impacts on Sacramento River hydrologic conditions and Delta inflows and outflows in ways that would conflict with other water management objectives or existing beneficial uses and will result in less than significant impacts related to the project infringing upon the water rights of other legal users of water. There are no other changes in the environmental setting or project characteristics that would raise important new surface water hydrology and quality issues. Therefore, proposed project changes do not alter the conclusions of the 2007 DWWSP EIR, result in any new significant impacts, or substantially increase the severity of the previously surface water hydrology and quality impacts.

Fisheries Biological Resources

Section 3.6 of the 2007 DWWSP EIR concluded that the proposed project could have potentially significant impacts on fish or other aquatic species and habitat during construction activities, by increasing turbidity, degrading water quality or otherwise altering suitable aquatic habitat. These impacts will be reduced to less than significant with the implementation of 2007 DWWSP EIR Mitigation Measures 3.6-6, implementation of a Stormwater Pollution Prevention Plan (SWPPP), and Mitigation Measures 3.6-4a through 3.6-4d, which include specific construction measures to minimize the disturbance to aquatic habitat and include the purchase of mitigation credits where permanent impacts to aquatic resources and habitat occur.

Section 3.6 of the 2007 DWWSP EIR concluded that the proposed project's operational impacts on juvenile and adult such as Chinook salmon, steelhead, sturgeon, and all other fish inhabiting the Sacramento River will be less than significant as a result of the installation of the proposed positive barrier fish screen on the proposed RD 2035 joint intake. The proposed intake fish screen will be designed to be operated, inspected, and maintained in accordance with CDFG, NMFS, and USFWS criteria, and will minimize entrainment and impingement of juvenile, sub-adult, and adult fish at the new intake. Additionally, none of the fish species that have been listed for protection under the Federal or California Endangered Species Acts will be vulnerable to entrainment at the intake, either because of their sizes when they occur in the area (e.g., salmon fry and smolts, juvenile sturgeon, etc) or because of their geographic distributions further downstream in the Delta (e.g., delta and longfin smelt). These facts, combined with the relatively low rate of diversions by the DWWSP when compared to flow rates in the Sacramento River, especially during the spring when most fish spawn and early larval stages are present, reduce the risk of potential adverse fishery impacts from project diversions.

Section 3.6 of the 2007 DWWSP EIR concluded that proposed groundwater substitution transfer programs would have less than significant impacts to fish and other aquatic species and habitat during construction activities with the implementation of 2007 DWWSP EIR Mitigation Measure 3.6-6, which includes implementation of the SWPPP, which will be designed to reduce water quality impacts to downstream receiving waters. The 2007 DWWSP EIR concluded that operation of the proposed groundwater substitution transfer wells would have no impacts on fish and other aquatic species because the proposed wells would be sited away from the Sacramento River consistent with 2007 DWWSP EIR Mitigation Measure 3.3-3 and would comply with DWR criteria to avoid groundwater/surface water interactions.

As discussed above, since the certification of the 2007 DWWSP EIR new regulatory restrictions have been imposed on CVP and SWP operations, which established new flow criteria for the Delta and its tributaries and new terms and conditions on CVP and SWP exports from the Delta. The updated CALSIM II modeling conducted for the SWRCB hearing reflects these regulatory changes and was used to assess how these new changes in flow criteria since the 2007 DWWSP EIR affect the analysis and conclusions in the EIR. The updated modeling results are summarized in Appendix A. Appendix B provides an update to the potential effects of the proposed project operations on fishery habitat in light of the regulatory changes in the delta and updated CALSIM II modeling. Results of these analyses show that the magnitude of changes in the Sacramento River flows is consistently less than 1 percent, with the majority of changes being within the range from -0.1 to -0.2 percent under both current and future conditions which is consistent with the modeling results of the 2007 DWWSP EIR. These results of the updated CALSIM II modeling conducted to reflect current regulatory and environmental conditions of the Delta are very similar to the results of the modeling conducted for the 2007 DWWSP EIR. Thus, the conclusions in the 2007 DWWSP EIR that are based on this hydrological modeling and that concern fish or other aquatic species and habitat during construction and operation remain unchanged.

In summary, the biological significance of reductions in Delta outflow within the range identified in the hydrologic simulation analyses for the DWWSP are not expected to be detectable in terms of changes in either estuarine habitat conditions or relationships between fish species abundance indices and Delta outflow. The biological responses, such as changes in habitat quality and availability, migration rates, juvenile survival, larval transport, etc., to these very small changes in river flows will be so small that they will not be detectable. Further, the relative magnitude and potential effects on fishery resources that will result from upstream diversions by the DWWSP will be diminished as flows pass further downstream and enter the Delta, where additional tributary inflows and tidal hydrodynamics will affect habitat conditions for estuarine fish and other aquatic resources. Lastly, because the characteristics of the proposed fish screen for the proposed intake will remain unchanged from the fish screen described in the 2007 DWWSP EIR, impacts to juvenile and adult fish such as Chinook salmon, steelhead, sturgeon, and fish species that have been listed for protection under the Federal or California Endangered Species Acts will be less than significant. Based on results of these analyses, it is concluded that the DWWSP will result in only small incremental reductions in Sacramento River flows, and that the biological impacts on fishery resources in the Sacramento River and Delta from these changes are found to be less than significant. This finding is consistent with the corresponding finding in the 2007 DWWPS EIR. As a result there are no changes in the

environmental setting or project characteristics that would raise important new fisheries resources impacts. Therefore, changes to the proposed project would not alter the conclusions of the 2007 DWWSP EIR, result in any new significant impacts, or substantially increase the severity of the previously identified fisheries resources impacts.

3.3 Effects Related to Changes in Proposed CPG Water Transfer

Appendix C provides a summary of the 2007 DWWSP EIR's potential environmental impacts and significance conclusions for each of the facility siting and water transfer options for the DWWSP, including the groundwater substitution transfer programs with upstream water sellers. As shown in the Appendix C, there were no significant impacts identified in the 2007 DWWSP EIR for any of the CEQA resource topics for the CPG groundwater substitution transfer program. These issues are re-evaluated below to determine whether the proposed modifications to the proposed CPG/WDCWA groundwater substitution program will result in any new significant impacts or substantially more severe impacts than those described in the 2007 DWWSP EIR.

Groundwater Hydrology and Quality

Section 3.3 of the 2007 DWWSP EIR concluded that the proposed groundwater substitution transfer wells would result in less than significant water quality impacts as a result of increases in groundwater pumping. Groundwater pumped for agricultural irrigation during the summer water transfers could contain higher levels of salts, dissolved solids, and other constituents when compared to the quality of the surface water used on Conaway Ranch. These changes could alter the quality of agricultural runoff or drainage. Additionally, TDS and boron concentrations are a known concern occurring in the groundwater in Yolo County and in the vicinity of the City of Woodland, City of Davis, and Conaway Ranch (MWH, 2007a,b). However, because groundwater would typically be blended with surface water, adverse impacts to groundwater quality or exceedance of any water quality standard or discharge requirement would be less than significant.

Section 3.3 of the 2007 DWWSP EIR also concluded that implementation of the groundwater substitution transfers would result in a less than significant impact related to groundwater drawdown as a result of increased groundwater pumping. During average water year conditions, drawdowns as a result of increased water pumping would be seasonal and within the historical range of groundwater level fluctuations during average water year conditions. During multiple-year drought conditions, project-related pumping would result in short term drawdowns. However, these drawdowns are not expected to be long-term, and groundwater levels would return to pre-project pumping levels following one or more normal to above normal precipitation cycles and likewise be within the historical range of groundwater level fluctuations during drought conditions. Additionally, new wells would be screened between 500 and 700 feet in depth, and would not affect domestic wells, which are typically located in the shallower groundwater zones above 225 feet in depth.

Section 3.3 of the 2007 DWWSP EIR also concluded that implementation of the groundwater substitution transfer wells would have a less than significant effect on the hydrology of the

Sacramento River because new wells would comply with criteria established by DWR (2002, revised 2010) to avoid groundwater/surface water interactions, as described in 2007 DWWSP EIR Mitigation Measure 3.3-3. If sited consistent with this criteria, the operation of these wells would not have an adverse impact on Sacramento River flows.

The proposed modifications to the groundwater substitution transfer program with CPG would result in similar less than significant impacts to groundwater hydrology and quality, as described in the 2007 DWWSP EIR. Because well installation would comply with Mitigation Measure 3.3-3 and the amount of groundwater pumped would not exceed the 10 TAF/yr amount for CPG transfer analyzed in the 2007 DWWSP EIR, there would be no additional changes in the environmental setting or project characteristics that would raise important new groundwater hydrology or quality impacts. Therefore, proposed project changes in the CPG wells would not alter the conclusions of the 2007 DWWSP EIR, result in any new significant impacts, or substantially increase the severity of the previously identified groundwater hydrology and quality impacts.

Drainage and Floodplains

Section 3.4 of the 2007 DWWSP EIR concluded that potentially significant drainage and floodplains impacts related to the proposed groundwater substitution transfer wells would be limited to construction phase soils erosion. These impacts would be mitigated to less than significant with the incorporation of 2007 DWWSP Mitigation Measure 3.3-1a and 3.3-1b, which includes compliance with a SWPPP and related best management practices. All other drainage and floodplains impacts were found to be less than significant.

The proposed modifications to the groundwater substitution transfer program with CPG would result in similar impacts to drainage and floodplains to those described in the 2007 DWWSP EIR. Specifically, construction related soils erosion would be mitigated to less than significant with the incorporation of Mitigation Measure 3.3-1a and 3.3-1b. Additionally, the proposed new groundwater substitution wells would result in less than a 900-square foot increase in impervious surfaces for each well site and include only minor above ground appurtenances. In comparison to surrounding open agricultural areas, these new wells would not create perceptible increases in local surface runoff or impede or redirect flood flows. As a result, there are no changes in the environmental setting or project characteristics that would raise important new drainage and flood plain impacts. Therefore, proposed project changes would not alter the conclusions of the 2007 DWWSP EIR, result in any new significant impacts, or substantially increase the severity of the previously identified drainage and flood plain impacts.

Land Use and Agriculture

Section 3.5 of the 2007 DWWSP EIR did not identify any significant land use and agriculture impacts associated with construction or operation of the proposed groundwater substitution transfer wells. Construction of wells to facilitate the substitution of groundwater supplies would be done away from urban areas and enable continued agricultural practices on lands where senior water rights holders currently provide water for irrigation of agricultural crops. This substitution will allow

surface water supplies to be used by the DWWSP when Term 91 is in effect without causing permanent or long-term fallowing of agricultural land.

The proposed modifications to the groundwater substitution transfer program with CPG would result in similar less than significant impacts to land use and agriculture to those described in the 2007 DWWSP EIR. Wells would be located on agricultural land away from urban areas and would be consistent with agricultural zoning and existing uses. A typical well site would occupy about 900 square feet of area, for approximately 0.21 acres for the proposed 10 wells. Impacts would be spread out over a large area and would be too small to constitute an impact to prime or unique farmland or result in the conversion of agricultural lands to non-agricultural use. There are no changes in the environmental setting or project characteristics that would raise important new land use and agricultural issues. Therefore, proposed project changes would not alter the conclusions of the 2007 DWWSP EIR, result in any new significant impacts, or substantially increase the severity of the previously identified land use and agricultural impacts.

Terrestrial Biological Resources

Section 3.6 of the 2007 DWWSP EIR concluded that impacts to terrestrial biological resources related to the proposed groundwater substitution transfer wells would be limited to construction activities. Potential impacts to habitat and species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG, USFWS, or NMFS could be encountered and would be mitigated to less than significant with the incorporation of applicable 2007 DWWSP EIR Mitigation Measures 3.6-7a through 3.6-7x, which include pre-construction through post-construction measures specific to species and habitat that may be present in the construction area. Implementation of these measures will reduce construction and operational project related impacts to terrestrial biological resources to less than significant.

The proposed modifications to the groundwater substitution transfer program with CPG would result in similar construction related impacts to those described in the 2007 DWWSP EIR. Specifically, construction activities may adversely affect the habitat and temporarily impede the local movement of candidate, sensitive, or special-status species as determined by CDFG and USFWS however implementation of the applicable 2007 DWWSP EIR Mitigation Measures 3.6-7a through 3.6-7x and 3.6-7a through 3.6-7c would reduce any construction related impacts to candidate, sensitive, or special-status species and wetlands to less than significant. There are no changes in the environmental setting or project characteristics that would raise important new biological resources issues. Therefore, proposed project changes would not alter the conclusions of the 2007 DWWSP EIR, result in any new significant impacts, or substantially increase the severity of the previously identified biological resources impacts.

Geology, Soils, and Seismicity

Section 3.7 of the 2007 DWWSP EIR concluded that potentially significant geology, soils, and seismicity impacts related to the proposed groundwater substitution transfer wells would be limited to seismic hazards and seismic related ground failure and construction related soils erosion. These impacts would be mitigated to less than significant with the incorporation of 2007 DWWSP EIR

Mitigation Measures 3.7-1a through 3.7-1c which includes detailed geotechnical studies of construction areas and consultation with federal, state, and local agencies, as appropriate; and 3.7-2a through 3.7-2b which includes implementation of stormwater and erosion control measures during construction. All other construction and operational impacts related to geology, soils, and seismicity were determined to be less than significant.

The proposed modifications to the groundwater substitution transfer program with CPG would result in encounters with similar geologic conditions, require implementation of the same mitigation measures as those described in the 2007 DWWPS EIR and not change the risks of people or structures to adverse geologic hazards, including seismic hazards and soils related hazards including potential erosion during construction, expansive soils, and soil subsidence. Therefore, the conclusions and proposed mitigation measures of the existing geology, seismicity, and soils analysis within the 2007 DWWSP EIR remain unchanged and are applicable to the proposed changes described in this addendum. There are no changes in the environmental setting or project characteristics that would raise important new geology, seismicity, and soils issues. Therefore, proposed project changes would not alter the conclusions of the 2007 DWWSP EIR, result in any new significant impacts, or substantially increase the severity of the previously identified geology, soils, and seismicity impacts.

Air Quality

Section 3.8 of the 2007 DWWSP EIR concluded that construction of groundwater substitution transfer wells would result in potentially significant construction-related air emissions consisting of exhaust emissions from vehicles and drilling equipment, and fugitive dust. These emissions would be similar to those associated with construction of other project components however, emissions would be minor because of the minimal equipment required to construct individual water wells. Wells would be constructed in relatively isolated areas and would have a small disturbance footprint. Impacts associated with well construction would be mitigated to less than significant with the incorporation of 2007 DWWSP EIR Mitigation Measure 3.8-1a through 3.8-1e which include measures designed to reduce construction related exhaust and particulate emissions consistent with the Yolo-Solano Air Quality Management District. Diesel particulate matter (DPM) emissions associated with increased groundwater pumping generated by the new groundwater wells during water transfer activities would be less-than-significant with implementation of 2007 DWWSP EIR Mitigation Measures 3.8-1c through 3.8-1e which includes siting criteria for diesel equipment, energy usage requirements, and screening-level DPM assessments for diesel equipment within 500 feet of sensitive receptors. Impacts related to odor were determined to be less than significant given that water supply facilities, including groundwater pumping, is not a typical odor generating use. Significant and unavoidable air quality impacts were limited to potential conflicts with state and local air quality plans during construction.

The proposed modifications to the groundwater substitution transfer program with CPG would result in similar construction air quality impacts to those described in the 2007 DWWSP EIR. These emissions would consist of exhaust emissions from vehicles and drilling equipment, and fugitive dust. These emissions are expected to be similar to those associated with construction of other project components, previously discussed, and likely to be minor because of the minimal equipment to be

used to construct individual water wells. Wells would be constructed in relatively isolated areas and would have a small disturbance footprint. Implementation of 2007 DWWSP EIR Mitigation Measure 3.8-1a through 3.8-1e would reduce potential construction emissions impacts to less than significant.

Operational emissions associated with the proposed groundwater wells would be generated during the use of pumps and emergency generators. This equipment would operate during periods of high peak demand for water (typically June through September) or during emergencies. The increased emissions from diesel or gasoline engines are not expected to result in a significant adverse impact on the environment or people. Additionally, because operations of the proposed groundwater wells would not occur during the winter, which results in reduced annual average DPM emissions, it is not expected that the risk would exceed the less-than-significant impact associated with the identified receptors located within 200 feet of the DPM emission source. Based on this comparison, the DPM emissions from new diesel-powered groundwater pumps or diesel-powered emergency generators and their associated health risk would be less than significant. Implementation of2007 DWWSP EIR Mitigation Measures 3.8-1c through 3.8-1e would ensure that DPM emissions would not pose conditions that exceed the previously studied impacts. Lastly, because the proposed wells would only result in a temporary construction and minor operational increase in vehicle trips, the increases are so small that they will not result in any perceptible increase in pollutants and this will not conflict with applicable air quality plans. This impact would be less than significant. There are no changes in the environmental setting or project characteristics that would raise important new transportation and circulation issues. Therefore, changes to the proposed project would not alter the conclusions of the 2007 DWWSP EIR, result in any new significant impacts, or substantially increase the severity of the previously identified air quality impacts.

Noise

Section 3.9 of the 2007 DWWSP EIR concluded that potentially significant impacts would be limited to nighttime noise impacts during construction of the groundwater substitution transfer wells and exceed local noise ordinance standards and existing ambient noise levels. However, construction noise would be temporary and less than significant. Potentially significant impacts associated with permanent operational noise increases above existing ambient noise levels would be mitigated to less than significant with the incorporation of Mitigation Measure 3.9-1f and 3.9-1g, which includes well siting requirements and incorporation of design features to acoustically shield enclosures around stationary noise sources within the proximity of sensitive receptors. All other construction and operational noise related impacts were determined to be less than significant.

The proposed modifications to the groundwater substitution transfer program with CPG would result in similar construction and operational noise impacts to those described in the 2007 DWWSP EIR. However, well drilling would not be required to occur at night and would be temporary and would therefore be less than significant. Operational noise associated with the proposed groundwater wells includes the noise from infrequent use of pumps and emergency generators. This equipment would operate during periods of high peak demand for water (typically June through September) and during emergencies. Implementation of 2007 DWWSP Mitigation Measure 3.9-1f and 3.9-1g would ensure that the groundwater wells conform to Yolo County noise level standards and

would thus result in less than significant operational noise impacts. There are no changes in the environmental setting or project characteristics that would raise important new noise issues. Therefore, changes to the proposed project would not alter the conclusions of the 2007 DWWSP EIR, result in any new significant impacts, or substantially increase the severity of the previously identified transportation and circulation impacts.

Hazards and Hazardous Materials

Section 3.10 of the 2007 DWWSP EIR identified potentially significant hazards and hazardous materials impacts during construction and operation of the proposed groundwater substitution transfer wells including transport of hazardous materials, potential for an accidental spill, potential exposure to hazardous materials and hazardous materials sites located adjacent to proposed project facilities, and the increased risk of wildland fire and would all be mitigated to less than significant with the incorporation of 2007 DWWSP EIR Mitigation Measures 3.10-1a through 3.10-1d, 3.10-2, 3.10-3, 3.10-5a through 3.10-5b, and 3.10-6a through 3.10-6b, which includes measures related to the storage, transport and handling of construction and operational related hazardous materials and the preparation of a Hazardous Materials Management Plan. All other construction and operational hazards and hazardous materials impacts were determined to be less than significant.

The proposed modifications to the groundwater substitution transfer program with CPG would have a less than significant impact on hazards and hazardous materials with the incorporation of the above mentioned mitigation measures. Based on land use information described in Section 3.5 of the 2007 DWWSP EIR, there is no information that indicates the presence of hazardous materials at the proposed well sites or historic land uses that may pose a residual hazard. However, construction activities and pumping of groundwater on Conaway Ranch would likely involve the use of diesel fuel, hydraulic oil, and other hazardous materials. As a result, potential exists for the accidental release of these materials into the environment and could also increase the risk of wildland fire. This potential impact would be reduced to less than significant by the implementation of 2007 DWWSP EIR mitigation measures 3.10-1a through 3.10-d. There are no changes in the environmental setting or project characteristics that would raise important new hazards and hazardous materials issues. Therefore, changes to the proposed project would not alter the conclusions of the 2007 DWWSP EIR, result in any new significant impacts, or substantially increase the severity of the previously identified hazards and hazardous materials impacts.

Public Health

Section 3.11 of the DWWSP EIR provided a discussion of the public health issues related to substituting existing groundwater supplies with Sacramento River water as the primary source of drinking water supply. Because the changes in the regulatory environment related to the Delta and proposed modifications to the Conaway Ranch groundwater substitution transfer program would not affect the treatment or delivery of surface water for municipal use as described in the 2007 DWWSP EIR, the changes to the proposed project would not alter the conclusions of the 2007 DWWSP EIR, result in any new significant impacts, or substantially increase the severity of the previously identified public health impacts.

Transportation and Circulation

Section 3.12 of the DWWSP EIR concluded that potentially significant traffic impacts associated with the proposed new groundwater substitution wells would be limited to the construction phase of the project. However, implementation of Mitigation Measures 3.12-1a through 3.12-1g and 3.12-4c, which includes preparation of a traffic control plan during the construction phase, as appropriate, and coordination local transportation agencies during periods of heavy construction, would reduce this impact to less than significant. Operational traffic impacts would be limited to infrequent maintenance of proposed project groundwater substitution transfer wells and would be less than significant.

The proposed modifications to the groundwater substitution transfer program with CPG would have a less than significant impact on transportation and circulation. Traffic and circulation impacts would be limited to the construction of wells on Conaway Ranch and would be installed away from major roads. Construction activities themselves would be temporary in duration and generate small amounts of traffic with approximately 3-5 construction-worker vehicles onsite at any given time. Additionally, implementation of Mitigation Measures 3.12-1a through 3.12-1g, which include measures to reduce or eliminate transportation and circulation conflicts during the construction phase of the project, would reduce potential construction related impacts to less than significant. Once in operation, the proposed wells would generate less than significant amounts of traffic that would be limited to infrequent maintenance activities and would mostly be contained within Conaway Ranch consistent with regular agricultural operations. There are no changes in the environmental setting or project characteristics that would raise important new transportation and circulation issues. Therefore, changes to the proposed project would not alter the conclusions of the 2007 DWWSP EIR, result in any new significant impacts, or substantially increase the severity of the previously identified transportation and circulation impacts.

Public Services and Utilities

Section 3.13 of the 2007 DWWSP EIR concluded that construction and operation of the proposed groundwater substitution transfer wells would result potentially significant impacts to public services and utilities. Specifically, construction of project wells could result in the disruption of utility services, which could include underground electricity, gas, telephone, and cable television lines located within construction areas. However, implementation of mitigation measure 3.13-6, which requires the preparation of a utility avoidance plan, would reduce impacts to underground utilities to less than significant. All other construction and operational impacts to public services and utilities associated with groundwater transfer well construction, including construction of new or expansion of existing public utilities, adequate landfill capacity during construction and operation, and violation of solid waste disposal regulations were determined to be less than significant.

The proposed modifications to the groundwater substitution transfer program with CPG would not result in an increase in water supply for the DWWSP and would therefore not change the population assumptions provided in the 2007DWWSP EIR or alter the conclusions regarding the construction of new or expansion of existing public utilities. Additionally, construction of new wells would not require the demolition of facilities and would generate minimal amounts of new solid

waste and not alter the conclusions of the 2007 DWWSP EIR regarding adequate solid waste capacity or violation of solid waste disposal regulations. During well installation, temporary disturbance to the well site could result in conflicts with other existing utilities. However, implementation of Mitigation Measure 3.13-6, which requires preparation of a utility avoidance plan, would reduce this impact to less than significant. There are no changes in the environmental setting or project characteristics that would raise important new public services and utilities issues. Therefore, changes to the proposed project would not alter the conclusions of the 2007 DWWSP EIR, result in any new significant impacts, or substantially increase the severity of the previously identified public services and utilities impacts.

Cultural Resources

Section 3.10 of the 2007 DWWSP EIR concluded that construction of the proposed groundwater substitution wells has the potential to disturb or destroy undiscovered archaeological resources, Native American human remains, or paleontological resources. However, these impacts would be reduced to less than significant within the implementation of Mitigation Measure 3.14-1 which requires implementation of a construction monitoring and inadvertent discovery plan and measures to minimize or eliminate direct impacts to any found significant archaeological, Native American, or paleontological resources.

The proposed modifications to the groundwater substitution transfer program with CPG could have a potentially significant impact on cultural resources. Unknown or undiscovered paleontological resources, sites, or geologic features, historic sites, human burial sites, and/or scattered remains related to historic and prehistoric occupation of the area could be inadvertently encountered anywhere within the project area during construction activities. Damage to these previously undisturbed resources would constitute a significant impact. However, this impact would be mitigated to less than significant with the incorporation of 2007 DWWSP EIR Mitigation Measure 3.14-1, which requires implementation of a construction monitoring and inadvertent discovery plan and measures to minimize or eliminate direct impacts to any found significant archaeological, Native American, or paleontological resources. As a result, there are no changes in the environmental setting or project characteristics that would raise important new cultural resources issues. Therefore, proposed Project revisions would not alter the conclusions of the 2007 DWWSP EIR, result in any new significant impacts, or substantially increase the severity of the previously identified cultural resources impacts.

Recreation

Section 3.15 of the 2007 DWWSP EIR concluded that development of the proposed groundwater substitution transfer wells would have a less than significant impact on recreational resources. Proposed wells would be located on private agricultural land and would not interfere with or reduce access to recreational activities in the project area, nor would it directly increase demand for recreational facilities that would require the construction or expansion of existing recreational facilities.

The proposed modifications to the groundwater substitution transfer program with CPG would not directly affect recreational resources as they would be constructed on private agricultural land.

The water supply from the proposed groundwater substitution program would also remain unchanged from the 2007 DWWSP EIR and would not directly result in the increase in use or expansion of existing or planned recreational facilities. There are no changes in the environmental setting or project characteristics that would raise important new recreation issues. Therefore, proposed project revisions would not alter the conclusions of the 2007 DWWSP EIR, result in any new significant impacts, or substantially increase the severity of the previously identified recreation impacts.

Aesthetics

Section 3.16 of the 2007 DWWSP EIR concluded that aesthetics impacts associated with groundwater substitution transfer wells would be less than significant. During installation, temporary disturbance to the well site would occur with introduction of drilling equipment and other vehicles. Each wellhead would remain visible to the surrounding area; however, wellheads would not be distinguishable from other wells installed for domestic or agricultural purposes. Proposed new wells would become an integral component of the working landscape and not detract from the visual resources of the area. All other construction and operational aesthetics impacts were determined to be less than significant.

The proposed modifications to the groundwater substitution transfer program with CPG would not have a significant impact on the visual environment. During installation, temporary disturbance to the well site would occur with introduction of drilling equipment and other vehicles. However, in operation, wellheads would not be distinguishable from other wells installed for domestic or agricultural purposes and would represent a common feature of the working agricultural landscape and not detract from the visual resources of the area. The changes to the proposed project would not change the character or quality of the project site or its surroundings, nor would they substantially affect the amount of light and glare generated, therefore the conclusions of the aesthetics analysis from the 2007 DWWSP EIR remain unchanged. There are no changes in the environmental setting or project characteristics that would raise important new visual or aesthetic issues. Therefore, changes to the proposed project would not alter the conclusions of the 2007 DWWSP EIR, result in any new significant impacts, or substantially increase the severity of the previously identified aesthetics impacts.

Cumulative and Growth Inducing Effects

The proposed changes surrounding the proposed project do not alter the underlying impact conclusions or growth assumptions of the 2007 DWWSP EIR. Therefore, there would be no change in the cumulative or growth inducing effects of the proposed project. None of the significance conclusions or findings in the Final EIR would be altered, no new significant impact would occur, and none of the previously identified significant impacts would be substantially worsened.

3.4 Conclusion

This addendum documents that the changes in the regulatory framework for Delta water and aquatic resources as well as the minor revisions to one element of the proposed project (number and locations of CPG groundwater wells) will not result in any new or more severe impacts than

those discussed in the 2007 DWWSP EIR. None of the conditions or circumstances that would require preparation of a subsequent or supplemental EIR pursuant to Public Resources Code Section 21166 exists for the proposed project with these changes.

3.5 References

California Department of Water Resources (DWR). 2002. Draft Water Transfers White Paper for Water Transfers Involving the Department of Water Resources. Water Transfers Office. Revised, January 2010.

Environmental Science Associates (ESA). 2007a. Davis Woodland Water Supply Project Draft Environmental Impact Report. Prepared for the City of Davis, U.C. Davis and the City of Woodland, April 2007.

Environmental Science Associates (ESA). 2007b. Davis Woodland Water Supply Project Final Environmental Impact Report. Prepared for the City of Davis, U.C. Davis and the City of Woodland, October 2007.

MWH, 2007a. Water Right Diversion Modeling Technical Appendix to the Draft Environmental Impact Report. Davis-Woodland Water Supply Project. December, 2006.

MWH, 2007b. Addendum to the Modeling Appendix of the DEIR for the Davis-Woodland Water Supply Project

Appendix A

Testimony of Walter Bourez, P.E. before the State Water Resources Control Board Water Right Applications 30358A and 30358B

ESA

EXHIBIT WDCWA-100

TESTIMONY OF WALTER BOUREZ, P.E.

1. I am a registered civil engineer in the State of California and am employed by the firm of MBK Engineers ("MBK"). I hold Bachelor of Science and Master of Science degrees in Civil Engineering from California State University, Sacramento.

2. I have over 20 years of experience in water resources engineering and have worked on numerous projects involving the modeling of surface water systems, including many projects involving the operation of CalSim models of state and federal water systems in the Central Valley.

3. A sample of the projects in which I have been involved include: (1) revising CalSim II to better represent the physical characteristics of the Sacramento River, Colusa Basin Drain and Stony Creek; (2) working with the federal Bureau of Reclamation to document aspects of the CalSim II model hydrology; (3) serving as a key developer of the CalSim model's depiction of the San Joaquin River system, including the operations of numerous upstream reservoirs in that system and of all water districts in the San Joaquin River basin; and (4) performing hydrologic modeling analysis to determine potential impacts to river systems tributary to the Sacramento – San Joaquin River Delta and in the Delta from proposed actions and projects including: DWR's Franks Tract Project, San Joaquin River Restoration, Upper San Joaquin River Basin Storage Investigation, Delta-Mendota-Canal Recirculation Study, Sacramento Water Forum EIR, EIR/EIR for serving CVP contracts under Public Law 101-514, Hamilton City Pumping Plan Fish Screen Improvement Project EIR/EIS, DWR's Delta Risk Management Strategy, San Luis Low Point Improvement Project EIS, water transfers analysis, and numerous other projects.

4. A copy of my resume, which accurately describes my education and experience, is Exhibit WDCWA-101.

5. For this hearing, I was asked to prepare exhibits and testimony on the following subjects:
   a. Background information describing how Term 91 diversion prohibition works;
   b. Background information on the CalSim II hydrological model;
   c. My update of the CalSim II modeling that was performed for the 2007 Davis-Woodland Water Supply Project (DWWSP) EIR to include most recent Central Valley Project (CVP) and State Water Project (SWP) system operating criteria; and
   d. The results of this updated CalSim II modeling including:
      i. The numbers of months during which the Term 91 diversion prohibition would be in effect and the amounts of water that would be available for diversion under the DWWSP water-right permits during a repeat of the 82-

year simulation period; and

ii. The impacts of these DWWSP diversions on Sacramento River and Delta flows and CVP/SWP system operations;

e. The effects of potential future changes in Delta outflow requirements on the amounts of water that will be available for diversion under the DWWSP water-right permits; and

f. Claims that water in the Bay-Delta Watershed is greatly over appropriated.

TERM 91 BACKGROUND

6. Standard Permit Term 91 originally was adopted by the State Water Resources Control Board (SWRCB) on November 19, 1981 and is described in SWRCB Order WR 81-15. Order WR 81-15 and the subsequent Water Right Decision 1594 and Order WR 84-2 developed a method, which became Standard Permit Term 91. Term 91 specifies a method for determining when water is not available for diversion under post-1965 water-right permits for diversions in the Delta watershed. Water-right permits and licenses with Term 91 are junior in priority to any Delta regulatory standards adopted by the SWRCB in the past and any new Delta regulatory standards that may be adopted by the SWRCB in the future.

7. Diversions must be curtailed under permits with Term 91 when satisfaction of inbasin entitlements requires release of supplemental Project water by the CVP or the SWP.

8. Inbasin entitlements are defined as all rights to divert water from streams tributary to the Sacramento-San Joaquin Delta or the Delta for use within the respective basins of origin or the Legal Delta, unavoidable natural requirements for riparian habitat and conveyance losses, and flows required by the State Water Resources Control Board for maintenance of water quality and fish and wildlife. Export diversions and Project (CVP and SWP) carriage water are specifically excluded from the definition of inbasin entitlements.

9. Supplemental Project water is defined as that water imported to the basin by the Central Valley Project and State Water Project plus water released from Project storage which is in excess of export diversions, Project carriage water, and Project inbasin deliveries.

10. The SWRCB notifies permittees of curtailments of diversion under Term 91 when the SWRCB finds that supplemental Project water has been released or will be released. The SWRCB advises permitees of the probability of imminent curtailment of diversions under Term 91 as far in advance as practicable based on anticipated requirements for supplemental Project water provided by the CVP and SWP operators.

11. Implementation of Standard Permit Term 91 is expressed in the following equation:

$$SW = SR – (EX + CW)$$

SW - Supplemental Project water
SR - Total amount of water released from CVP and SWP storage and import facilities
EX - Total CVP and SWP export diversions from the Delta
CW - Carriage water associated with CVP and SWP exports

CalSim II BACKGROUND

WRIMS

12. The Water Resources Integrated Modeling System (WRIMS) is a generalized water resources software program developed by the Bay-Delta Office of the Department of Water Resources (DWR). WRIMS is entirely data driven and can be applied to most reservoir-river basin systems. WRIMS represents a given physical system (reservoirs, streams, canals, pumping plants, etc.) through a network of nodes and arcs. The model user describes system connectivity and various operational constraints using a modeling language known as Water Resources Simulation Language (WRESL). WRIMS simulates facility operations using optimization techniques to route water through the network based on mass balance accounting. A mixed integer programming solver determines an optimal set of decisions at each monthly time step for a set of user-defined priorities (weights) and system constraints.

CalSim II

13. Because the CVP and SWP are California's largest water projects, their operations influence, and at times control, flow in the Sacramento and San Joaquin river basins and the Delta. For this hearing, we simulated water conditions and facility operations in the Delta and upstream areas using the CalSim II model.

14. CalSim II is an application of the WRIMS software that was jointly developed by the Bureau of Reclamation (Reclamation) and DWR for performing planning studies related to CVP and SWP operations. The primary purpose of CalSim II is to evaluate the water supply reliability of the CVP and SWP at current or future levels of development (e.g., 2005, 2030), with and without various assumed future facilities, and with different modes of facility operations. Geographically, the model covers the drainage basin of the Delta, and CVP and SWP exports to the San Francisco Bay Area (Bay Area), Central Coast, and Southern California. The model assumes that facilities, land use, water supply contracts, and regulatory requirements are constant over the period of simulation, representing a fixed level of development. The historical flow record of October 1921 to September 2003, adjusted for the influences of land use changes and upstream flow regulation, is used to represent the possible range of future hydrological conditions. Upstream water use is based on best available estimates of diversions and depletions using land use and irrigation factors to depict actual water use as accurately as possible. Major Central Valley rivers, reservoirs, and CVP and SWP facilities are represented by a network of arcs and nodes. CalSim II uses monthly mass balance accounting, and

therefore cannot simulate the tidal hydrodynamics of the Delta, and has limited ability to represent Delta water quality.

15. CalSim II can be used in either a comparative or an absolute mode. In the absolute mode, results of a single model run, such as the amount of delivery or reservoir levels, are considered directly. The comparative mode consists of comparing two model runs: one that contains a proposed project alternative and one that does not. Differences in certain factors, such as deliveries, river flows, and reservoir storage levels, are analyzed to determine the effects of the project alternatives on system-wide operations. All of the assumptions are the same for the No Action/No Project alternative and action alternative model runs, except for assumptions regarding the action itself, and the focus of the analysis is on the differences in the results. In comparative analysis, model biases tend to cancel out. As such, the measured differences in comparative analysis are generally considered more accurate than the absolute values of the individual studies.

16. Results from a single simulation may not necessarily correspond to actual system operations for a specific month or year, but are representative of general water supply conditions. Model results are best interpreted using various statistical measures such as long-term or year-type averages.

17. For a few months of the 82-year simulation period, CalSim II can simulate significantly different operations under similar conditions. The reasons for this are the threshold triggers used in CalSim operations logic. For example, in CalSim II, when modeled Lake Oroville storage falls below 1 MAF, modeled Oroville storage releases are made solely to support in-basin uses and in-stream flow requirements. Under such conditions, any modeled release from Oroville storage that supports south-of-Delta exports is incidental. On the other hand, if modeled Oroville storage is above 1 MAF, significant modeled releases are allowed from Oroville storage to support south-of-Delta exports when needed. For this reason, CalSim II modeling could result in a significantly different modeled operation for a given month if Oroville storage begins the month at 1.001 MAF in one study and at 0.999 MAF in another. Of course, in real-time, SWP operators would be equally protective of Oroville storage in both cases if everything else in the system was roughly the same. This is just one example of several threshold triggers that can cause differences between different model runs.

18. Such simulated changes in operations are modeling artifacts, and for the most part, differences due to these modeling artifacts tend to average out over the simulation period. Thus, while one study may have large exports in one month, the alternative will likely have increased exports in another. During wetter years the differences in modeled impacts are typically minimal. However, during drought years, the response to the threshold triggers can cause significant differences in modeled Delta water quality and project deliveries between different model runs, even though differences in assumptions for the different model runs are not large. When caused by modeling artifacts, such differences in model results are not an accurate measure of actual project impacts. Therefore, modeled operations are closely examined to determine when changes are "real", and when they are "artificial." In the few cases where artificial changes caused

unrealistic modeled project impacts (both positive and negative), the operations logic was changed to allow for more reasonably similar modeled operations for similar conditions. Even with these changes, all regulatory standards were left in place.

19. To conduct the hydrologic analysis for DWWSP diversions under its requested water-right permits, I used the version of the CalSim II model that was used by DWR to develop its 2009 State Water Project Delivery Reliability Report study, which DWR released to the public on January 29, 2010. This model is available for download from DWR's Web site at:

http://baydeltaoffice.water.ca.gov/modeling/hydrology/CalSim/Downloads/CalSimDownloads/CalSim-IIStudies/SWPReliability2009/index.cfm

20. I have reviewed the version of the CalSim II model described above, and for the analyses described in this testimony, the following minor adjustments were made to this model to shorten model run time and prevent oscillations between model cycles:

    a. Condensed model from a two-step TXFR study to a single-step CONV study;
    b. Operated Contra Costa Water District Delta diversions to DSM2 pre-processed intake salinity instead of ANN calculated intake salinity; and
    c. Minor adjustment to the implementation of the Delta Cross Channel RPA in the Delta Smelt Biological Opinion.

21. All of the scenarios were modeled over the 82-year period of hydrological record from 1922 through 2003. Existing levels of development in the Sacramento Valley, San Joaquin Valley, and export service areas were assumed. For a list of detailed assumptions, refer to Appendix A in the State Water Project Delivery Reliability Report (December 2009).

UPDATED CalSim II MODELING

22. The purpose for updating the CalSim II modeling of the DWWSP is to evaluate the project under current CVP/SWP system operating criteria. Since the CalSim II analysis of DWWSP was developed in support of the 2007 DWWSP EIR, changes have occurred that could affect the assessment of DWWSP water availability and impacts. These changes are:
    a. The salmon and smelt Biological Opinions were updated due to a decision by Judge Wanger nullifying the previous Biological Opinions. The updated biological opinions established new flow criteria in the Delta and its tributaries for the protection of salmon and smelt.
    b. The University of California at Davis reduced its project demand for DWWSP water, thereby reducing project demand from 56,717 AF/year to 46,136 AF/year.

23. Assumptions regarding the DWWSP described in the 2007 EIR modeling technical appendix are implemented in the updated modeling and the same CalSim II modeling methodology (with the updates described above) is used for the updated analysis.

24. For the updated analysis four modeling scenarios were performed:
    a. Existing Conditions
    b. Existing Conditions With Project
    c. Cumulative Conditions
    d. Cumulative Conditions Without Project.

25. The Existing Conditions scenario assumes existing facilities and operating criteria and the Existing Conditions With Project scenario assumes the DWWSP is added to the Existing Conditions scenario. For future level of development the Cumulative Conditions scenario includes reasonably foreseeable projects, including the DWWSP. The Cumulative Conditions Without Project assumes reasonably foreseeable projects without the DWWSP.

26. To determine the effects of the DWWSP on Sacramento River and Delta flow, the Existing Conditions With Project model simulation is compared to Existing Conditions, and the Cumulative Conditions model simulation is compared to Cumulative Conditions Without Project. The results of the comparisons of these model simulations are in Exhibits WDCWA-102 WDCWA-102and WDCWA-103,WDCWA-103 which include the following:

    a. DWWSP modeled diversions;
    b. Percentages of time when Term 91 curtailments are in effect;
    c. Summary results of comparisons;
    d. Summaries of average Delta flows and changes;
    e. Modeled Delta outflows and differences; and
    f. Modeled Sacramento River flows at Freeport and differences.

27. These results are described in detail in the following paragraphs.

28. Exhibit WDCWA-102, page 2 is a table of monthly DWWSP diversions under the proposed water-right permits for the Existing Conditions With Project model run. The maximum annual diversion is 46,136 AF and the minimum annual diversion is 21,900 AF. Although the seasons when Term 91 curtailments would be in effect in the updated modeling are similar to these seasons in the modeling performed for the 2007 EIR, there are variations in how often the Term 91 curtailments would be in effect. Exhibit WDCWA-102, page 3 lists the monthly frequencies of when the Term 91 diversion curtailment would be in effect under both scenarios.

29. Exhibit WDCWA-102, page 4 lists annual and dry year averages for key system parameters for both scenarios with the updated modeling. Although the Existing Conditions scenario in the updated modeling differs from the Existing Conditions scenario for the 2007 EIR because of recent changes in CVP and SWP operating criteria,

the relative differences in flows in the updated modeling are very similar to differences in the 2007 EIR modeling.

30. Exhibit WDCWA-102, page 5 is a schematic of Delta channels with labels at key locations listing the location name, Existing Conditions (labeled as "Base") average flow, and average change in flow. The magnitudes of flow changes in the updated modeling are similar to those in the 2007 EIR modeling and all still are minor relative to the magnitudes of flows in the Existing Conditions modeling.

31. Exhibit WDCWA-102, page 6 lists average monthly Delta outflows for the Existing Conditions scenario, Exhibit WDCWA-102, page 7 lists average monthly Delta outflows for the Existing Conditions With Project scenario, and Exhibit WDCWA-102, page 8 lists the average monthly differences in Delta outflows between these two scenarios.

32. Exhibit WDCWA-102, page 9 lists average monthly Sacramento River flows at Freeport for the Existing Conditions scenario, Exhibit WDCWA-102, page 10 lists average monthly Sacramento River flows at Freeport for the Existing Conditions With Project scenario, and Exhibit WDCWA-102, page 11 lists the average monthly differences in Sacramento River flows at Freeport between these two scenarios.

33. Exhibit WDCWA-103, page 2 is a table of monthly diversions for the Cumulative Conditions model run. The maximum annual diversion under the proposed DWWSP water-right permits is 46,136 AF and the minimum annual diversion is 18,300 AF. Although the seasons when Term 91 curtailments would be in effect in the updated modeling are similar to these seasons in the modeling performed for the 2007 EIR, there are variations in how often Term 91 curtailments would be in effect; Exhibit WDCWA-103, page 3 lists the monthly frequencies of Term 91 curtailments for both scenarios.

34. Exhibit WDCWA-103, page 4 lists annual and dry year averages for key system parameters for both scenarios with the updated modeling. Although the Cumulative Conditions scenario in the updated modeling differs from the Cumulative Conditions scenario for the 2007 EIR because of recent changes in CVP and SWP operating criteria, the relative differences in flows in the updated modeling and the 2007 modeling are very similar.

35. Exhibit WDCWA-103, page 5 is a schematic of Delta waterways with labels at key locations listing the location name, Cumulative Conditions (labeled as "Base") average flow, and average change in flow. The magnitudes of flow changes in the updated modeling are similar to those in the 2007 EIR and all still are minor relative to the magnitudes of flows in the Cumulative Conditions scenario.

36. Exhibit WDCWA-103, page 6 lists average monthly Delta outflows for Cumulative Conditions Without Project, Exhibit WDCWA-103, page 7 lists average monthly Delta outflows for the Cumulative Conditions scenario, and Exhibit WDCWA-103, page 8 lists the average monthly difference in Delta outflows between these two scenarios.

37. Exhibit WDCWA-103, page 9 lists average monthly Sacramento River flows at Freeport for the Cumulative Conditions Without Project scenario, Exhibit WDCWA-103, page 10 lists average monthly Sacramento River flows at Freeport the for Cumulative Conditions scenario, and Exhibit WDCWA-103, page 11 lists the average monthly differences in Sacramento River flows at Freeport between these two scenarios.

38. Exhibits WDCWA-102 and WDCWA-103 demonstrate that the modeled effects of DWWSP diversions under its proposed water-right permits in the updated modeling are very similar to the modeled effects in the modeling done for the 2007 EIR. The conclusions in the 2007 EIR that are based on this hydrological modeling therefore, will not change because of the updated modeling.

POTENTIAL FUTURE CONDITIONS

39. The purpose of this portion of my testimony is to address the State Water Board's key hearing issue of whether water is available for appropriation pursuant to Applications 30358A and 30358B. I also address the Protestants' argument in their August 16, 2010 letter to the SWRCB that, because diversions from the Sacramento River should be reduced by 3 to 5 maf/yr to provide for greater Delta outflows, the SWRCB should not issue any water-right permits for the DWWSP.

40. The SWRCB's August 2010 Delta flow criteria report does not adopt any new flow requirements, and my understanding is that the SWRCB must balance all competing demands on the available water supplies before it may establish any new flow requirements. Nevertheless, to address the Protestants' argument, we performed an analysis to estimate the monthly frequencies of when water would be available for diversion under the proposed DWWSP water-right permits if the SWRCB were to adopt the Delta flow criteria in the August 2010 report.

41. This analysis was performed by comparing the proposed SWRCB Delta flow criteria to flows in the output from the version of the CalSim II model that was used by DWR to develop its 2009 State Water Project ("SWP") reliability study and was also used in our updated CalSim II analysis that is described above. For this analysis, the following flow criteria were compared to corresponding flows in the CalSim II output:
    a. Minimum Delta outflow at 75% of unimpaired Delta outflow from January through June;
    b. Minimum Sacramento River at Rio Vista at 75% of Sacramento River unimpaired flow from November through June;
    c. Minimum Sacramento River below Georgiana Slough of 13,000 cfs in November, April, and May; and
    d. Minimum San Joaquin River flow at Vernalis at 60% of San Joaquin River unimpaired flow from February through June.

42. Flow criteria for Old and Middle Rivers (OMR) are listed in the August 2010 SWRCB Delta flow criteria report but are not addressed in our analysis. This is because OMR

flow criteria result in decreases in CVP and SWP Delta exports and increases in Delta outflows and potentially in Delta outflow surpluses, and the frequency of water available for diversion under the DWWSP therefore, probably would increase if these OMR criteria were included in our analysis.

43. For this analysis, water available for diversion is calculated as the minimum of the surplus flow in the Sacramento River at Rio Vista, the surplus flow in the Sacramento River below Georgiana Slough, and surplus Delta outflow. San Joaquin River flow criteria are only considered when we were estimating surplus Delta outflows. The table in Exhibit WDCWA-104 lists the percentages of time during each month when surpluses would be present in the Sacramento River and the Delta under this analysis. The monthly percentages in this table indicate how often water would be expected to be available for diversion under the proposed DWWSP water-right permits if the SWRCB were to adopt the flow criteria in the 2010 report as regulatory requirements. As this table indicates, even if the SWRCB were to adopt such regulatory requirements, water still would be available for diversion under the proposed DWWSP water-right permits during December through March of many water years. With such requirements, Term 91 still would prohibit the DWWSP from diverting water under its proposed water-right permits during times when surplus flows would not be present.

44. This conclusion is consistent with the facts that there are times when the Sacramento River Basin is in flood conditions, and even if 75% of unimpaired flow under such conditions must flow out of the Delta, there still would be significant amounts of water available for diversion under the proposed DWWSP water-right permits. The aerial photograph in Exhibit WDCWA-105, page 2 is of the flood of March 1940 and was taken looking east toward the Sutter Buttes, with the town of Colusa on the Sacramento River in the right foreground. Under these conditions, the Sutter Basin, a natural overflow area incorporated into the flood control project as a bypass, was filled entirely with water stretching from the Sacramento River east levee to the foot of the Sutter Buttes. Water was entering the Basin through overbank flows along the east bank of the upper Sacramento River, and through two of the fixed weirs, Moulton Weir and Colusa Weir (just upstream, to the left of this photo). The Sutter Basin empties into the Sutter Bypass, a wide flood channel that carries excess Sacramento River flood water parallel to the River down to the confluence of the Feather and Sacramento Rivers.

45. The two aerial photographs in Exhibit WDCWA-105, page 3 of the Sacramento River and Fremont Weir were taken on February 20, 2004 by Joseph Countryman of MBK Engineers. When the Sacramento River flow reaches about 56,000 cfs, water begins to flow over the Fremont Weir into the Yolo Bypass. In 2004, the flow over the weir was greater than 50,000 cfs.

46. Under conditions like these, water would be available for diversion under the proposed DWWSP water-right permits, even if the SWRCB were to adopt the flow criteria in its August 2010 report as regulatory requirements.

ALLEGED OVER APPROPRIATION OF WATER IN BAY-DELTA WATERSHED

47. The purpose of this portion of my testimony is to address the State Water Board's hearing issue of whether water is available for appropriation pursuant to Applications 30358A and 30358B. In addition, I address the Protestants' reliance on claims that water in the Bay-Delta Watershed is greatly over-appropriated. Claims by the Protestants, relative to the Bay-Delta Watershed, appear to rely on work that was done for, and statements that were made by, the Delta Vision Blue Ribbon Task Force. As discussed in the following paragraphs, these statements rely on inappropriate data and do not consider pertinent water-rights and water-use information, data, and knowledge.

48. The Protestants have used two different portions of the SWRCB's September 26, 2008 letter to Delta Vision to support their position. It is clear the SWRCB's letter, when read in its entirety, was attempting to suggest a comparison of water right face value with the unimpaired flow is not appropriate. Rather than attempt to interpret the SWRCB letter for use in this hearing, I will leave it to the SWRCB, with its understanding of face values of water rights, actual diversions and use, and other relevant information to evaluate the usefulness of this letter for this hearing. However, I do provide the following pertinent details.

49. All references to water right data in my testimony are based on the State Water Board's eWRIMS database. The database I am relying on is dated March 2010.

50. It is my understanding the data used in arriving at the statements of over appropriation are based on water right data and information for both consumptive and non-consumptive uses. This often can lead to incorrect conclusions, because the same water often is diverted and used under several different water-right permits and licenses. For example, a review of the eWRIMS database for the Pit River System demonstrates that the Pacific Gas and Electric Company ("PG&E") has appropriative water rights for direct diversions for hydroelectric power generation at eight different powerhouses upstream of Shasta Lake on the Pit River System. (We have not included the PG&E Powerhouse, known as the James Black Powerhouse, as it diverts water from the McCloud River and Iron Canyon Creek and complicates the point being made here.) Exhibit WDCWA-106 is a map showing the locations of these powerhouses. A table summarizing the key water right data is provided in Exhibit WDCWA-107. As can be seen on Exhibit WDCWA-106, three of these powerhouses are on two separate upstream tributaries.

51. The sum of the direct diversion rates contained in the water rights for the eight powerhouses on the main stem of the Pit River and the two upstream tributaries is 42,875 cfs, with a range from 500 cfs to 8,000 cfs. The total face value of these water rights is 31,055,303 acre-feet.

52. Water that is diverted at each powerhouse is returned to the Pit River system and then is diverted by the next downstream powerhouse. For this reason, the same water can be

appropriated and diverted up to seven times. (Water diverted by the Hat Creek Powerhouse No. 1 and Hat Creek Powerhouse No. 2 is not diverted by the Pit River No 1 Powerhouse, so no water goes through all eight powerhouses.) The highest diversion rate of any of these powerhouses is 4,850 cfs, therefore this is the maximum being diverted. Thus, it would be most accurate to state that a total of 4,850 cfs has been appropriated by PG&E for use at eight different powerhouses, even though the simple addition of all of the direct-diversion rights results in a total of 42,875 cfs. This demonstrates that simply adding up the face value of all of the water-right permits, licenses, and statements in the Delta watershed significantly overestimates the amounts of water that is diverted and used in the watershed. Moreover, none of the water that is diverted by any of these powerhouses is consumed; instead, all of it continues to flow downstream, where it is available for subsequent appropriations by direct diversions and diversions to storage for consumptive and non-consumptive purposes.

53. Exhibits WDCWA-106 and WDCWA-107 also demonstrate that a single powerhouse may be covered by multiple water rights. For example, the Pit River No. 3, Pit River No. 4, Pit River No. 6, and Pit River No. 7 Powerhouses all are subject to both post-1914 applications and statements of diversion and use, which were filed for claims of riparian or pre-1914 appropriative rights. Thus, each of these powerhouses may have multiple entries in the eWRIMS database for the same diversions and uses. These separate entries should not be added to determine the total amounts of water that are appropriated for these powerhouses.

54. Water is appropriated for direct diversion and storage for both consumptive and non-consumptive purposes. This is demonstrated by a brief review of the water rights for Shasta Dam that are on file with the SWRCB. There are three water rights for consumptive use and two water rights for non-consumptive use at Shasta Dam. These are summarized in Exhibit WDCWA-108. The water rights for consumptive and non-consumptive uses are for the same water. This was, and continues to be, the standard practice for water right applications for multi-purpose projects. As a result, there are two or more entries in the eWRIMS database for diversions of the same water. Also, as discussed above, a portion of the water that is appropriated at Shasta Dam has previously been appropriated upstream several times by PG&E in the Pit River watershed, from which water flows into Shasta Lake. Similar examples are provided in Exhibits WDCWA-109 and WDCWA-110 for Oroville and Folsom Dams, respectively.

55. The entries in the eWRIMS database are for the amounts of maximum authorized diversions, not the amounts of consumptive use or depletions. A water user must hold a water right sufficient to cover its maximum diversion. These diversions must be adequate to cover transportation losses, deep percolation, and other losses as well as consumptive use requirements of the irrigated crop when the water used is for irrigation. To fully meet the consumptive use requirements of a crop, some level of tailwater is necessary. The current method for flood irrigating rice includes a level of flow-through to manage water quality; this is referred to as cultural water. The tailwater and cultural water returns to the stream system and is available for appropriation. Even the entries in

the eWRIMS database for irrigation water rights therefore almost always overstate the amounts of water that are consumptively used pursuant to these rights.

56. Moreover, many water rights contain a term specifying an amount for maximum authorized diversion and use that can be significantly less than the face value of the water right that appears in the eWRIMS database. For example, the four water rights shown in Exhibit WDCWA-109 for Oroville Dam have terms limiting the combined maximum diversion to storage to 3,880,000 acre-feet per year. This total is far less than the total face value of the storage portion of these four water rights which total 7,960,000 acre-feet per year. This total does not include the direct diversion portion of the four water rights shown in Exhibit WDCWA-109.

57. Also, there are a large number of water right holders within the Sacramento Valley that have agreed to maximum diversions under their water rights that are far less than total the face values of their water rights through water-rights Settlement Contracts with the U.S. Bureau of Reclamation and the Department of Water Resources. These include the Sacramento River Settlement Contractors with the U.S. Bureau of Reclamation and the State Water Contractors on the Feather River System with the Department of Water Resources.

58. The claims of over appropriation also do not address the physical availability of water for diversion under a particular water right. In many streams, the physical availability of water limits the amount of water that may be diverted under a particular water right to an amount that is far less than the water right's face value. For example, the eWRIMS database contains entries for numerous water rights for diversions of water from west side tributaries to the Sacramento River. Based on my knowledge of this system and U.S. Geological gages, there are many times no water is physically available in these west side tributaries for diversion during times when the water rights authorize such diversions. Entries in the eWRIMS database for such water rights significantly overstate the amounts of water that actually can be diverted under these rights.

59. The claims of over appropriation include the water rights of the CVP and SWP for exports of water from the Sacramento Valley. These water rights are junior in priority to, and contingent on meeting, in-basin needs and environmental needs of the Bay-Delta Estuary. Also, authorized diversions under these water rights have been greatly restricted under the federal Endangered Species Act. The face values of these water rights in the eWRIMS database therefore are significantly greater than the actual amounts of water that may be diverted under these water rights.

60. The SWRCB's September 26, 2008 letter states that "actual use under existing water rights is clearly a better metric to compare with unimpaired flow than is face value but the State Water Board has limited information on actual use". Through my work on the Delta planning models, I have evaluated the estimated maximum annual depletion within the Sacramento Valley to be approximately 5 MAF. This does not include the areas above the major reservoirs, such as Shasta Lake and Lake Oroville. However, the depletion from these latter area is insignificant in comparison. The annual unimpaired

flow for the Sacramento River watershed is approximately 9 MAF for the 90% exceedance (dry year) and 32 MAF for a 10% exceedance (wet year). Exhibit WDCWA-111 provides this information in graphical form. While this also is not a completely appropriate comparison, particularly because it does not consider month-to month variations in water availability. Still, as discussed in the SWRCB's letter, this is a better metric for estimating availability of water for appropriation.

61. The best available tool for determining when water will be available for appropriation is the CalSim II modeling discussed above. As discussed above, our CalSim II modeling work shows that water is available for appropriation by the DWWSP, and that Term 91 will prohibit the DWWSP from diverting water under its proposed water-right permits during times when there is no unappropriated water.

Exhibit WDCWA-102

Existing Conditions
And
Existing Conditions With Project
CalSim II Modeling

Davis Woodland Project Diversion

Existing with Project **1000 AF**

Year Type	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
AN	1922	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	4.9	0.0	36.4
BN	1923	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
C	1924	4.7	3.2	2.6	2.5	2.3	3.0	0.0	0.0	0.0	0.0	0.0	4.8	22.9
D	1925	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
D	1926	4.7	3.2	2.6	2.5	2.3	3.0	3.7	0.0	0.0	0.0	0.0	4.8	26.6
W	1927	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	0.0	0.0	31.5
AN	1928	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	0.0	26.7
C	1929	0.0	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	26.9
D	1930	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
C	1931	4.7	3.2	2.6	2.5	2.3	3.0	0.0	0.0	0.0	0.0	0.0	4.8	22.9
D	1932	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	0.0	4.8	36.3
C	1933	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
C	1934	4.7	3.2	2.6	2.5	2.3	3.0	3.7	0.0	0.0	0.0	0.0	0.0	21.9
BN	1935	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	0.0	4.8	36.3
BN	1936	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	0.0	4.8	36.3
BN	1937	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
W	1938	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	4.9	4.9	0.0	41.4
D	1939	4.7	0.0	2.6	2.5	2.3	3.0	3.7	0.0	0.0	0.0	0.0	4.8	23.5
AN	1940	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	0.0	26.7
W	1941	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	4.9	0.0	36.4
W	1942	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	4.9	4.9	0.0	41.4
W	1943	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	4.9	0.0	36.4
D	1944	4.7	0.0	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	28.3
BN	1945	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	0.0	4.8	36.3
BN	1946	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
D	1947	4.7	3.2	2.6	2.5	2.3	3.0	3.7	0.0	0.0	0.0	0.0	4.8	26.6
BN	1948	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	0.0	4.8	36.3
D	1949	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
BN	1950	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	4.9	4.8	36.4
AN	1951	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	0.0	26.7
W	1952	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	4.9	4.9	0.0	41.4
W	1953	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	4.9	0.0	36.4
AN	1954	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	0.0	26.7
D	1955	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
W	1956	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	4.9	4.9	0.0	41.4
AN	1957	4.7	0.0	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	0.0	23.6
W	1958	4.7	3.2	2.6	2.5	2.3	0.0	3.7	4.9	4.8	4.9	4.9	0.0	38.4
BN	1959	4.7	0.0	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	28.3
D	1960	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
D	1961	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
BN	1962	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
W	1963	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	4.9	0.0	36.4
D	1964	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
W	1965	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	4.9	0.0	36.4
BN	1966	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
W	1967	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	4.9	4.9	0.0	41.4
BN	1968	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	4.9	4.8	36.4
W	1969	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	4.9	4.9	0.0	41.4
W	1970	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	4.9	0.0	31.7
W	1971	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	4.9	0.0	36.4
BN	1972	4.7	0.0	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	4.9	4.8	33.3
AN	1973	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	4.9	0.0	31.7
W	1974	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	4.9	4.9	0.0	41.4
W	1975	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	4.9	0.0	36.4
C	1976	4.7	3.2	2.6	2.5	2.3	3.0	3.7	0.0	0.0	0.0	0.0	4.8	26.6
C	1977	4.7	3.2	2.6	2.5	2.3	3.0	0.0	0.0	0.0	0.0	0.0	4.8	22.9
AN	1978	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	4.9	4.8	41.2
BN	1979	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	4.9	4.8	36.4
AN	1980	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	4.9	0.0	36.4
D	1981	4.7	0.0	2.6	2.5	2.3	3.0	3.7	0.0	0.0	0.0	0.0	4.8	23.5
W	1982	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	4.9	4.9	4.8	46.1
W	1983	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	4.9	0.0	36.4
W	1984	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	4.9	0.0	31.7
D	1985	4.7	3.2	2.6	2.5	2.3	3.0	3.7	0.0	0.0	0.0	0.0	4.8	26.6
W	1986	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	4.9	0.0	31.7
D	1987	4.7	0.0	2.6	2.5	2.3	3.0	3.7	0.0	0.0	0.0	0.0	4.8	23.5
C	1988	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
D	1989	4.7	3.2	2.6	2.5	2.3	3.0	3.7	0.0	0.0	0.0	0.0	4.8	26.6
C	1990	4.7	3.2	2.6	2.5	2.3	3.0	0.0	4.9	0.0	0.0	0.0	4.8	27.8
C	1991	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
C	1992	4.7	0.0	2.6	2.5	2.3	3.0	3.7	0.0	0.0	0.0	0.0	4.8	23.5
AN	1993	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	4.9	0.0	36.4
C	1994	4.7	3.2	2.6	2.5	2.3	3.0	0.0	0.0	0.0	0.0	0.0	4.8	22.9
W	1995	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	4.9	4.9	4.8	46.1
W	1996	0.0	0.0	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	4.9	0.0	28.6
W	1997	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	4.9	0.0	31.7
W	1998	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	4.9	4.9	0.0	41.4
W	1999	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	4.9	0.0	36.4
AN	2000	4.7	0.0	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	4.9	4.8	33.3
D	2001	4.7	0.0	2.6	2.5	2.3	3.0	3.7	0.0	0.0	0.0	0.0	4.8	23.5
D	2002	0.0	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	26.9
AN	2003	0.0	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	4.9	0.0	31.8
	Avg.	4.4	2.8	2.6	2.5	2.3	2.9	3.5	4.0	1.9	0.7	2.2	2.7	32.4
	Max	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	4.9	4.9	4.8	46.1
	Min	0.0	0.0	2.6	2.5	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.9

Year type is based on Sacramento River 40-30-30 index: Wet (W), Above Normal (AN), Below Normal (BN), Dry (D), Critical (C)
Shaded periods indicate that Term 91 diversion prohibition is in effect

Percent of time Term 91 curtailments are in effect

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2007 EIR	1%	7%	0%	0%	1%	1%	10%	21%	67%	95%	86%	11%
Updated	5%	13%	0%	0%	0%	1%	6%	18%	61%	87%	56%	43%

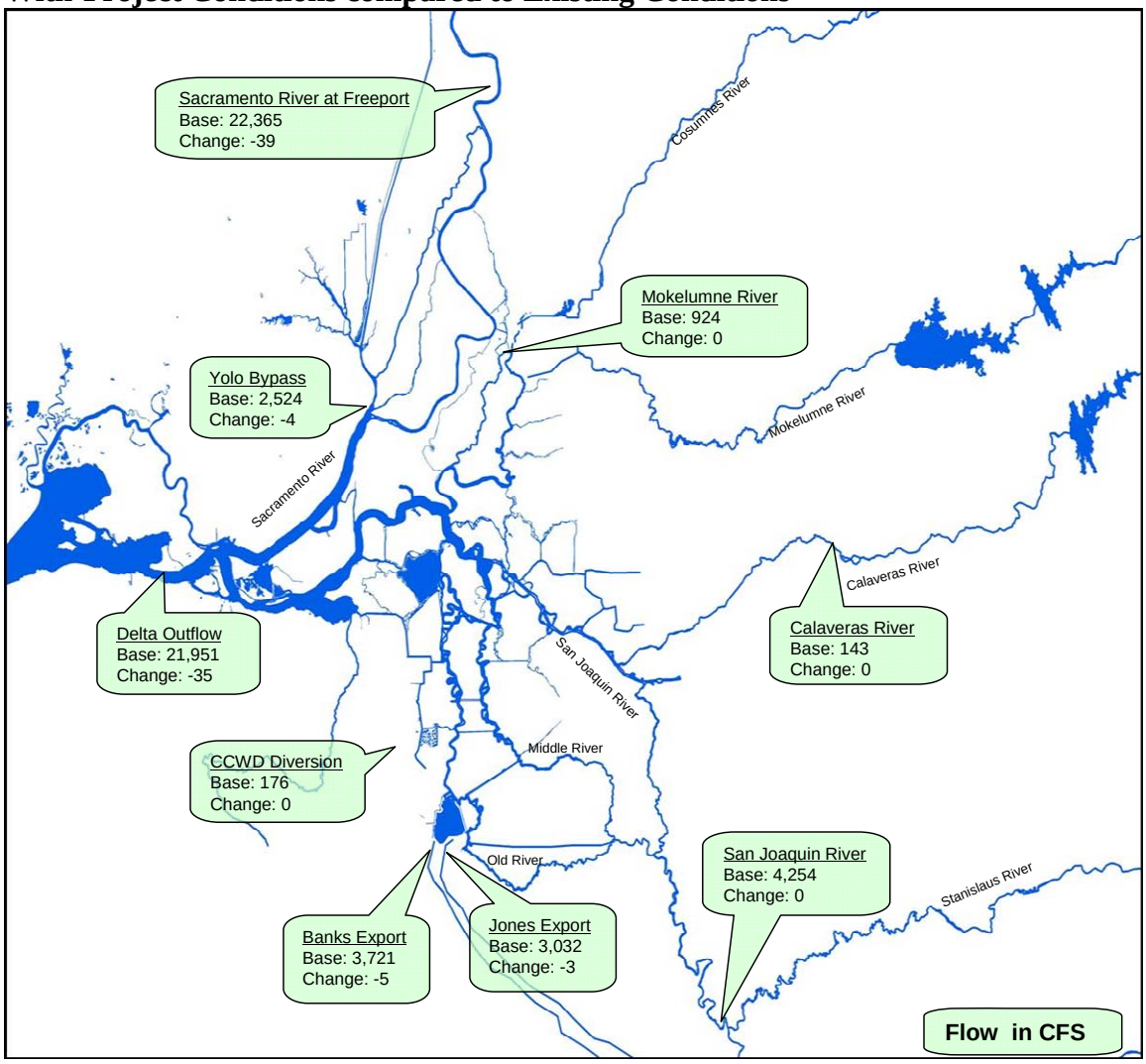
Summary Results, With-Project Conditions Compared to Existing Conditions

Items	Existing Conditions		With-Project Conditions		Difference: With Project	
	Long-Term	Dry Periods	Long-Term	Dry Periods	Long-Term	Dry Periods
DWWSP (1,000 AF/year)[1]						
Water Right diversion	0	0	32	27	32	27
Delta (1,000 AF/year) [1]						
Export at Banks Pumping Plant	2,701	1,614	2,697	1,611	-4	-3
Export at Tracy Pumping Plant	2,198	1,591	2,197	1,588	-2	-2
Total exports	4,899	3,205	4,893	3,199	-6	-6
Contra Costa Water District diversion	128	130	128	130	0	0
North Bay Aqueduct/City of Vallejo	69	52	69	52	0	0
Georgiana Slough	2,741	1,729	2,737	1,727	-4	-3
Delta Cross Channel	1,042	1,004	1,042	1,001	-1	-2
Total Delta inflow	21,727	10,043	21,696	10,024	-31	-20
Net Delta outflow	15,784	5,641	15,759	5,628	-25	-13
QWEST	2,005	175	2,006	176	1	1
Surplus Delta outflow	10,587	1,387	10,555	1,378	-32	-9
River Flows (cfs) 1						
Trinity River below Lewiston	949	601	949	601	0	0
Sacramento River below Keswick	8,648	6,126	8,648	6,136	0	10
Sacramento River below NCP	9,200	6,156	9,203	6,166	3	10
Sacramento River below DWWSP	18,708	9,932	18,666	9,905	-41	-28
Sacramento River below Freeport	22,365	11,808	22,326	11,781	-39	-27
Feather River below Thermalito	4,388	2,192	4,388	2,189	0	-3
Feather River at mouth	7,760	3,267	7,760	3,267	0	0
American River below Nimbus	3,428	1,626	3,428	1,627	0	1
American River at H Street	3,285	1,489	3,285	1,490	0	1
Calaveras River below Bellota Weir	143	8	143	8	0	0
San Joaquin River at Vernalis	4,254	1,802	4,254	1,802	0	0
Reservoir Carryover Storage (1,000 AF)[1]						
Trinity Lake	1,400	737	1,396	728	-4	-9
Whiskeytown Lake	233	224	233	224	0	0
Lake Shasta	2,690	1,494	2,686	1,487	-3	-7
Folsom Lake	511	302	510	300	-1	-1
CVP total NOD storage	4,833	2,756	4,825	2,739	-8	-17
CVP San Luis Reservoir	169	186	169	186	1	0
Lake Oroville	1,875	1,077	1,868	1,070	-7	-7
SWP San Luis Reservoir	461	315	461	315	0	0
New Hogan Reservoir	151	85	151	85	0	0
New Melones Reservoir	1,167	516	1,167	516	0	0
CVP-SWP Deliveries (1,000 AF/year)[2]						
CVP NOD agricultural deliveries	224	46	224	45	-1	-1
CVP NOD M&I deliveries	144	116	144	116	0	0
CVP SOD agricultural deliveries	876	224	874	221	-2	-3
CVP SOD M&I deliveries	117	91	117	91	0	0
SWP Table A deliveries	2,230	1,309	2,228	1,307	-2	-2
SWP Article 21 deliveries	79	42	77	42	-2	0

[1] Dry periods are water-year based (Oct 1928 - Sep 1934, Oct 1975 - Sep 1977, and Oct 1986 - Sep 1992)

[2] Dry periods for CVP and SWP deliveries are contract-year based (CVP: Mar 1929 - Feb 1935, Mar 1976 - Feb 1978, and Mar 1987 - Feb 1993, SWP: Jan 1929 - Dec 1934, Jan 1976 - Dec 1977, Jan 1987 - Dec 1992).

Average annual Delta Flows,
With-Project Conditions compared to Existing Conditions



Delta Outflow

Existing Conditions **Flow in CFS**

Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	4000	4500	8978	12645	38527	26256	28640	56732	36649	8000	4000	13594
1923	6094	11094	29114	28340	15652	9320	27874	18090	8492	6500	4000	3553
1924	4000	4500	4500	7855	12847	9729	7268	4658	4000	4245	4500	3000
1925	3000	5063	6976	8268	71428	12806	28500	17017	5556	5000	3964	3565
1926	4000	4500	4500	13712	45995	12516	25616	10448	5156	5787	4189	3000
1927	4000	13495	14313	32285	122845	41676	51342	26754	13378	8000	4000	19922
1928	7813	15938	6617	20817	22571	84208	27296	10753	8317	10938	4000	11563
1929	5938	10625	4500	8545	12217	9013	8421	7100	7243	4000	4114	3000
1930	3000	4575	13410	19303	16819	28709	12169	9089	7100	5000	4519	3135
1931	4000	4500	4500	9586	8329	7611	7817	4710	4000	4000	4412	3000
1932	3000	5471	14033	17137	13985	10781	11153	13012	10288	5000	3500	3000
1933	4331	4500	4500	11382	7841	13464	9558	7480	7243	4000	4038	3000
1934	3000	5920	5254	14306	14427	10625	9673	7100	7100	4000	4276	3000
1935	3000	6645	3704	28619	9963	26046	54084	20257	8211	6500	4000	3000
1936	4015	4500	4500	40959	79504	32099	26763	17214	9302	6500	4000	3511
1937	4000	4500	4500	10661	47417	47588	27983	19690	10540	6500	4000	3000
1938	4000	18975	64976	30418	148031	167576	78111	67508	38406	8000	4000	20625
1939	7500	13706	4500	6882	8329	10961	10082	9724	5161	5045	4518	3177
1940	4000	4500	4500	33800	65944	108179	71064	18591	5968	10519	4000	11563
1941	5938	10625	38308	97770	119698	88490	76981	47286	12881	8000	4000	20938
1942	7656	14081	47361	78497	136454	23341	54330	40518	22540	8000	4000	21094
1943	7188	16250	15038	78978	54880	86235	33425	19548	7457	10664	4000	19375
1944	7500	12452	4647	11260	23093	18376	13020	10497	6508	5000	3899	3000
1945	4000	6008	11001	9298	52879	21892	15737	15026	7008	6500	4000	4027
1946	4000	5739	68845	46259	15036	18742	18213	16844	6365	6659	4000	3689
1947	4000	4500	9415	7531	14031	19794	12031	8350	7100	5000	4602	3837
1948	4000	4500	4500	12714	11145	12652	27020	30291	14993	6500	4000	4120
1949	4000	4500	6881	7549	7996	46269	13457	12168	6713	5000	4457	4490
1950	4000	4500	4500	19299	35539	16101	21671	15368	9207	6500	4000	3727
1951	4000	46410	103138	65657	67480	27802	18481	19451	6179	11184	4000	10781
1952	6563	10313	36937	82145	73857	62998	74709	75029	37018	11134	5247	20313
1953	8594	13226	26950	99952	20929	15590	20187	28911	20693	8000	4000	19688
1954	8125	15469	4538	22304	52074	45063	43839	13125	7073	12039	4000	11406
1955	6250	10313	13232	17422	8906	7576	11688	11358	6478	5000	4808	3712
1956	4000	4500	89857	162143	82561	36350	22999	44945	18031	8000	4000	20938
1957	7813	13608	4538	9148	15117	45096	14780	23096	6260	10032	4000	11875
1958	6868	9688	17916	39170	153214	116173	102575	53816	30490	8000	6002	18125
1959	9219	13489	4818	21302	49870	11377	11692	10723	6250	8528	4000	3184
1960	4000	4500	4500	8798	28476	18326	11854	10179	5818	5320	4586	3702
1961	4000	6543	8010	9173	33499	13771	8860	8403	7100	5260	5507	3663
1962	4000	4784	11204	5300	54871	20677	14384	11173	6629	8039	4000	3000
1963	29616	5734	23167	18393	76213	23478	96533	30303	8781	10578	4000	20078
1964	7656	15781	4500	20583	9608	7684	9506	9387	7243	5000	4625	3000
1965	4210	11100	78456	113229	33101	16965	49671	20867	9818	8720	4000	19844
1966	7813	15469	7565	24645	20516	18314	14887	9803	6422	8272	4000	3228
1967	4000	9628	36042	49829	53088	58289	57050	56996	41802	13995	5041	19375
1968	8281	13696	5094	23581	58058	29500	12755	11875	5682	8669	4000	3135
1969	4000	6672	15271	123693	133407	65685	60106	63664	33187	8000	4000	22031
1970	7188	14514	50945	208563	75470	35909	14736	14917	7541	10622	4000	18594
1971	8438	15313	49794	47976	19081	40573	26574	31288	14783	8000	4000	19063
1972	8438	14382	6938	11492	16199	27471	11404	9503	6885	7989	4000	3620
1973	4000	13519	22174	83546	88768	54184	18629	18400	9527	8396	4000	11719
1974	6250	51802	64947	131814	38755	106891	68615	24811	15103	8000	5558	18750
1975	8438	14426	5892	10179	57072	82258	26681	33111	20304	8000	4694	19063
1976	8438	15625	4945	6515	7990	8864	9582	4149	4000	4716	3837	3000
1977	4472	3986	4575	6788	7714	7239	7100	4000	4000	4000	4288	3000
1978	3334	5375	10223	67571	51377	69454	47339	25680	13299	8000	4000	11563
1979	5938	10625	4715	20996	33734	26770	18595	19527	7973	6500	4000	3064
1980	4000	12113	11816	110338	131829	60190	22393	18536	11500	8000	4000	11563
1981	6250	10313	5093	19097	22422	23513	14537	9863	6563	5000	4149	4031
1982	4000	27736	86975	76009	99276	83325	139388	46954	20201	8000	4000	19375
1983	16363	43834	84871	106614	177845	259411	89637	79526	72435	37590	16332	25568
1984	11466	78610	156543	63250	36266	34159	17296	14926	7700	9914	4000	19219
1985	8125	20120	12437	10090	11421	11198	13937	10554	6250	5000	4023	3935
1986	4000	4500	12014	22458	214776	143482	27077	20494	9907	8000	4000	18438
1987	8125	12577	4500	9463	15637	22286	9132	9944	6719	5000	3902	3000
1988	4000	4500	12447	26094	13741	6088	9852	7031	7100	4000	3659	3000
1989	3574	4529	4984	7620	8636	48385	19924	11015	5938	5158	4706	3573
1990	4000	4500	4500	14168	11400	11155	9591	5680	4000	4000	4142	3000
1991	3677	3986	4185	6304	7735	32887	10279	4991	4000	4799	4187	3000
1992	3289	5306	3500	6081	32788	16264	9661	6144	7100	4000	3000	3000
1993	3000	3500	5112	63563	55552	36847	39665	28144	22955	8000	4000	12188
1994	6563	10313	5179	8516	19153	7889	11116	8406	4000	4000	6093	3000
1995	3000	4062	8724	113209	47152	212270	68212	84361	40756	22235	9273	13750
1996	11875	12418	18726	47382	123381	68013	45611	49301	10906	8000	4000	21250
1997	7813	15625	78880	278836	72511	21270	19503	14266	7215	11075	4000	18750
1998	7813	15313	10992	47265	221728	81265	63283	59578	73715	27281	12416	19553
1999	9164	20150	30534	39819	93046	59328	30120	22789	11067	8000	4000	20078
2000	7500	15193	4538	21067	113139	62560	22166	19450	5750	10727	4000	11719
2001	5781	10469	4500	13581	24138	22710	12025	8038	7100	5000	3824	3000
2002	4000	5707	28065	48445	14232	16672	16554	12553	4932	5000	5401	3192
2003	4166	4500	38188	61433	20700	17839	28428	39501	7409	9270	4000	11563
Avg.	5981	11842	21665	42162	51743	42444	30055	22590	12713	7932	4516	9765
Max	29616	78610	156543	278836	221728	259411	139388	84361	73715	37590	16332	25568
Min	3000	3500	3500	5300	7714	6088	7100	4000	4000	4000	3000	3000

Delta Outflow

Existing with Project Conditions **Flow in CFS**

Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	4000	4500	8936	12604	38403	26208	28577	56653	36569	8000	4000	13594
1923	6094	11094	29058	28301	15652	9320	27806	18011	8492	6500	4000	3533
1924	4000	4500	4500	7815	12808	9729	7269	4660	4000	4244	4495	3000
1925	3000	5052	6956	8228	71389	12806	28389	16939	5556	5000	4008	3548
1926	4000	4500	4500	13672	45943	12516	25526	10448	5156	5787	4200	3000
1927	4000	13439	14272	32243	122408	41631	51278	26674	13298	8000	4000	19922
1928	7813	15938	6575	20777	22532	84093	27235	10674	8337	10939	4000	11563
1929	5938	10625	4500	8507	12178	9013	8358	7100	7243	4000	4122	3000
1930	3000	4578	13368	19265	16780	28662	12105	9009	7100	5000	4527	3135
1931	4000	4500	4500	9540	8329	7565	7817	4710	4000	4000	4412	3000
1932	3000	5471	13992	17099	13962	10781	11153	12933	10208	5000	3500	3000
1933	4331	4500	4500	11303	7802	13443	9558	7401	7243	4000	4080	3000
1934	3000	5884	5236	14259	14383	10625	9673	7100	7100	4000	4151	3000
1935	3000	6660	3686	28575	9935	25996	54021	20182	8341	6500	4000	3000
1936	4014	4500	4500	40918	78928	32053	26704	17135	9222	6500	4000	3496
1937	4000	4500	4500	10620	47527	47545	27922	19611	10706	6500	4000	3000
1938	4000	19010	64932	30059	147886	167527	78048	67429	38325	8000	4000	20625
1939	7500	13706	4500	6840	8329	10320	10020	9789	5151	5051	4508	3247
1940	4000	4500	4500	33761	65645	107966	71001	18512	5968	10530	4000	11563
1941	5938	10625	38179	97711	119634	88441	76918	47207	12801	8000	4000	20938
1942	7656	14081	47226	78457	136413	23292	54267	40439	22460	8000	4000	21094
1943	7188	16250	14986	78692	54824	86186	33363	19469	7377	10761	4000	19375
1944	7500	12452	4637	11220	23055	18329	12962	10417	6508	5000	3903	3000
1945	4000	5950	10956	9304	52873	21844	15675	14947	7008	6500	4000	4027
1946	4000	5443	68817	46214	15036	18390	18152	16764	6515	6563	4000	3701
1947	4000	4500	9373	7490	13990	19716	11968	8355	7100	5000	4602	3840
1948	4000	4500	4500	12670	11145	12599	26966	30096	14917	6500	4000	4119
1949	4000	4500	6855	7508	7956	46207	13395	12089	6713	5000	4463	4483
1950	4000	4500	4500	19253	35499	16053	21609	15289	9207	6500	4000	3674
1951	4000	47444	103032	65608	67158	27749	18418	19371	6191	11179	4000	10781
1952	6563	10313	36954	82104	73804	63012	74646	74950	36938	11054	5167	20469
1953	8438	13226	26808	99907	20887	15541	20124	28832	20613	8000	4000	19688
1954	8125	15469	4538	22163	52015	44914	43776	13045	7081	12042	4000	11406
1955	6250	10313	13189	17382	8906	7544	11625	11279	6478	5000	4813	3705
1956	4000	4500	89695	162016	82522	36326	22936	44866	17951	8000	4000	20938
1957	7813	13608	4538	9105	15073	44832	14718	23018	6259	10039	4000	11875
1958	6786	9688	17873	39129	153162	116173	102512	53737	30409	8000	5922	18125
1959	9219	13489	4806	21231	49724	11329	11629	10644	6250	8551	4000	3173
1960	4000	4500	4500	8758	28438	18084	11854	10100	5818	5336	4575	3698
1961	4000	6516	7881	9135	33457	13722	8860	8407	7100	5261	5506	3662
1962	4000	4759	11056	5256	54802	20630	14322	11094	6628	8060	4000	3000
1963	29503	5681	23125	18207	76173	23429	96470	30223	8700	10663	4000	19922
1964	7813	15625	4500	20539	9582	7716	9475	9307	7243	5000	4632	3290
1965	4000	11069	78514	113191	33059	16917	49610	20793	9738	8781	4000	19844
1966	7813	15469	7524	24604	20476	18211	14812	9724	6573	8126	4000	3271
1967	4000	9569	35936	49789	52759	58242	56987	56916	41721	13914	4961	19531
1968	8125	13696	5094	23388	58005	29451	12694	11798	5722	8645	4000	3135
1969	4000	6649	15230	123401	133382	65654	60043	63587	33108	8000	4000	22031
1970	7188	14514	50662	208531	75430	35860	14673	14837	7546	10628	4000	18594
1971	8438	15313	49667	47938	19040	40439	26512	31209	14703	8000	4000	19063
1972	8438	14382	6897	11452	16160	27274	11342	9423	6885	8008	4000	3613
1973	4000	13377	22113	83453	88727	54136	18566	18321	9600	8356	4000	11719
1974	6250	51704	64814	131773	38714	106842	68553	24732	15023	8000	5478	18750
1975	8438	14426	5849	10138	56932	82169	26619	33032	20224	8000	4613	19063
1976	8438	15625	4946	6474	7990	8820	9520	4149	4000	4723	3833	3000
1977	4475	3972	4584	6760	7714	7239	7100	4000	4000	4000	4268	3000
1978	3352	5325	10195	67521	51209	69357	47277	25601	13219	8000	4000	11563
1979	5938	10625	4764	20955	33689	26724	18539	19449	8056	6500	4000	3080
1980	4000	12025	11773	109537	131793	60221	22336	18456	11447	8000	4000	11563
1981	6250	10313	5093	18870	22382	23464	14474	9862	6563	5000	4150	4040
1982	4000	27695	86801	75867	99237	83257	139325	46875	20121	8000	4000	19375
1983	16048	43782	84829	106573	177804	259362	89574	79447	72355	37590	16252	25568
1984	11390	78556	156502	63209	36227	34111	17234	14847	7700	9926	4000	19219
1985	8125	20009	12397	10048	11379	11156	13874	10554	6250	5000	4024	3896
1986	4000	4500	11972	22418	214728	143187	27015	20414	9907	8000	4000	18438
1987	8125	12577	4500	9421	15597	22238	9071	9965	6719	5000	3880	3000
1988	4000	4500	12405	26054	13741	6088	9789	7031	7100	4000	3658	3000
1989	3572	4606	4781	7572	8636	48345	19864	11116	5781	5272	4630	3621
1990	4000	4500	4500	14124	11400	11103	9591	5601	4000	4000	3843	3000
1991	3847	3500	5834	4500	7725	32866	10247	4942	4000	4939	4107	3000
1992	3318	5264	3500	6088	32748	16215	9661	6144	7100	4000	3000	3000
1993	3000	3500	5100	63523	55512	36788	39608	27546	22915	8000	4000	12188
1994	6563	10313	5179	8477	19114	7844	11116	8406	4000	4000	6093	3000
1995	3000	4047	8715	112975	47049	212221	68148	84281	40675	22112	9195	13750
1996	11875	12418	18609	47505	123340	67964	45547	49222	10826	8000	4000	21250
1997	7813	15625	78684	278797	72470	21221	19441	14186	7234	11073	4000	18750
1998	7813	15313	10951	47167	221577	81216	63220	59499	73635	27200	12336	19553
1999	9088	20096	30493	39778	93005	59280	30057	22710	10987	8000	4000	20078
2000	7500	15193	4538	21017	113045	62513	22103	19371	5750	10734	4000	11719
2001	5781	10469	4500	13538	24098	22663	11964	8043	7100	5000	3823	3000
2002	4000	5671	28013	48321	14232	16631	16492	12474	4865	5000	5424	3185
2003	4169	4500	38142	61394	20660	17791	28366	39422	7240	9409	4000	11563
Avg.	5971	11830	21642	42068	51680	42377	30001	22523	12691	7933	4502	9771
Max	29503	78556	156502	278797	221577	259362	139325	84281	73635	37590	16252	25568
Min	3000	3500	3500	4500	7714	6088	7100	4000	4000	4000	3000	3000

Delta Outflow

Difference (With Project minus Existing Conditions) **Flow in CFS**

Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	0	0	-42	-41	-125	-48	-63	-79	-80	0	0	0
1923	0	0	-55	-39	0	0	-68	-79	0	0	0	-20
1924	0	0	0	-41	-39	0	0	2	0	-1	-5	0
1925	0	-10	-20	-40	-39	0	-110	-78	0	0	44	-17
1926	0	0	0	-40	-52	0	-89	0	0	0	11	0
1927	0	-55	-41	-42	-436	-45	-64	-80	-80	0	0	0
1928	0	0	-42	-41	-39	-115	-61	-79	20	2	0	0
1929	0	0	0	-39	-39	0	-63	0	0	0	8	0
1930	0	2	-42	-38	-39	-47	-63	-80	0	0	8	0
1931	0	0	0	-45	0	-46	0	0	0	0	0	0
1932	0	0	-41	-37	-23	0	0	-79	-80	0	0	0
1933	0	0	0	-79	-39	-22	0	-80	0	0	42	0
1934	0	-37	-18	-47	-44	0	0	0	0	0	-125	0
1935	0	15	-18	-44	-28	-50	-63	-76	130	0	0	0
1936	0	0	0	-41	-575	-46	-59	-79	-80	0	0	-14
1937	0	0	0	-42	110	-44	-62	-79	167	0	0	0
1938	0	35	-43	-359	-145	-49	-63	-79	-80	0	0	0
1939	0	0	0	-42	0	-641	-62	66	-10	5	-10	70
1940	0	0	0	-39	-299	-213	-62	-79	0	11	0	0
1941	0	0	-129	-59	-64	-49	-63	-79	-80	0	0	0
1942	0	0	-134	-40	-41	-49	-63	-79	-80	0	0	0
1943	0	0	-52	-286	-56	-49	-62	-79	-80	98	0	0
1944	0	0	-10	-41	-38	-48	-57	-79	0	0	4	0
1945	0	-58	-45	6	-6	-48	-62	-79	0	0	0	0
1946	0	-296	-28	-45	0	-352	-61	-79	150	-96	0	12
1947	0	0	-41	-41	-41	-79	-63	5	0	0	0	3
1948	0	0	0	-44	0	-53	-54	-195	-76	0	0	-1
1949	0	0	-26	-40	-40	-62	-63	-79	0	0	7	-7
1950	0	0	0	-46	-40	-48	-62	-79	0	0	0	-53
1951	0	1035	-106	-49	-322	-52	-63	-79	13	-6	0	0
1952	0	0	17	-40	-53	13	-63	-79	-80	-80	-80	156
1953	-156	0	-142	-45	-41	-49	-63	-78	-80	0	0	0
1954	0	0	0	-141	-59	-149	-62	-79	8	4	0	0
1955	0	0	-43	-40	0	-32	-63	-79	0	0	5	-6
1956	0	0	-161	-127	-39	-24	-63	-79	-80	0	0	0
1957	0	0	0	-42	-44	-263	-62	-79	0	7	0	0
1958	-81	0	-44	-41	-52	0	-63	-79	-80	0	-80	0
1959	0	0	-12	-71	-146	-48	-63	-79	0	23	0	-11
1960	0	0	0	-39	-39	-242	0	-79	0	16	-12	-4
1961	0	-27	-129	-38	-42	-49	0	5	0	1	-1	-1
1962	0	-25	-149	-43	-69	-47	-62	-79	-1	21	0	0
1963	-113	-53	-42	-186	-40	-49	-63	-80	-80	86	0	-156
1964	156	-156	0	-43	-26	32	-32	-79	0	0	7	290
1965	-210	-31	57	-38	-42	-48	-61	-75	-80	61	0	0
1966	0	0	-40	-40	-40	-103	-75	-79	151	-145	0	43
1967	0	-59	-106	-40	-329	-47	-63	-80	-81	-81	-81	156
1968	-156	0	0	-193	-53	-49	-61	-77	40	-24	0	0
1969	0	-23	-41	-292	-24	-32	-63	-77	-78	0	0	0
1970	0	0	-283	-32	-41	-49	-63	-79	5	6	0	0
1971	0	0	-128	-38	-41	-134	-62	-79	-80	0	0	0
1972	0	0	-41	-40	-39	-197	-62	-79	0	19	0	-6
1973	0	-142	-61	-93	-41	-49	-63	-79	73	-40	0	0
1974	0	-98	-132	-40	-41	-49	-62	-79	-80	0	-81	0
1975	0	0	-43	-40	-140	-89	-62	-79	-80	0	-80	0
1976	0	0	0	-41	0	-44	-63	1	0	6	-4	0
1977	3	-14	9	-29	0	0	0	0	0	0	-20	0
1978	18	-50	-28	-50	-169	-97	-62	-79	-80	0	0	0
1979	0	0	49	-41	-45	-46	-56	-78	83	0	0	16
1980	0	-88	-43	-801	-36	31	-57	-79	-52	0	0	0
1981	0	0	0	-228	-40	-49	-63	0	0	0	1	9
1982	0	-41	-174	-141	-39	-68	-63	-79	-80	0	0	0
1983	-315	-52	-42	-41	-41	-49	-63	-79	-80	0	-80	0
1984	-76	-54	-42	-41	-40	-49	-63	-79	0	11	0	0
1985	0	-111	-40	-42	-41	-41	-63	0	0	0	1	-39
1986	0	0	-42	-41	-49	-295	-62	-79	0	0	0	0
1987	0	0	0	-42	-40	-47	-61	21	0	0	-22	0
1988	0	0	-42	-40	0	0	-63	0	0	0	-1	0
1989	-3	77	-203	-47	0	-39	-60	101	-156	114	-75	47
1990	0	0	0	-44	0	-51	1	-79	0	0	-299	0
1991	171	-486	1649	-1804	-10	-20	-32	-49	0	140	-80	0
1992	29	-42	0	8	-40	-48	0	0	0	0	0	0
1993	0	0	-12	-40	-40	-59	-57	-598	-39	0	0	0
1994	0	0	0	-39	-39	-45	0	0	0	0	0	0
1995	0	-16	-9	-233	-103	-49	-64	-80	-81	-123	-78	0
1996	0	0	-117	122	-42	-49	-63	-79	-80	0	0	0
1997	0	0	-196	-39	-41	-49	-63	-79	19	-2	0	0
1998	0	0	-41	-98	-151	-49	-63	-80	-80	-80	-80	0
1999	-76	-54	-41	-41	-41	-48	-63	-80	-80	0	0	0
2000	0	0	0	-51	-93	-48	-63	-79	0	7	0	0
2001	0	0	0	-42	-39	-47	-61	6	0	0	-1	0
2002	0	-36	-52	-125	0	-40	-63	-79	-68	0	23	-7
2003	4	0	-46	-39	-40	-49	-63	-79	-169	138	0	0
Avg.	-10	-12	-23	-94	-63	-66	-54	-67	-22	1	-14	6
Max	-113	-54	-42	-39	-151	-49	-63	-80	-80	0	-80	0
Min	0	0	0	-800	0	0	0	0	0	0	0	0

Sacramento Flow at Freeport

Existing Conditions **Flow in CFS**

Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	12070	12904	16745	14532	30037	27480	22335	49660	34875	18627	15419	23672
1923	11747	16709	26609	25387	17820	11440	21079	15097	12064	19950	15806	11580
1924	9162	9681	9081	12137	14711	9568	7429	6026	8745	14881	8462	7916
1925	7565	7611	12342	12037	59670	16769	23016	13221	11765	18785	13332	12568
1926	9041	9050	9403	17331	37392	12050	19778	10473	13137	20101	16833	8069
1927	8985	21040	18408	31588	74612	41737	42771	24341	18184	21955	16129	30325
1928	11737	17928	15059	23859	21028	73714	24078	10102	15407	24420	16840	22231
1929	10986	13838	11667	12613	16041	12187	7828	7591	10747	12370	7406	7993
1930	7671	7292	17980	20499	18141	29346	11857	9916	12953	17609	13429	10923
1931	9021	8457	8004	13158	11517	8483	9738	7228	8375	13139	7827	7487
1932	7447	7196	18827	20264	13782	12230	9160	12306	13256	13624	9187	11237
1933	9273	8474	10482	14357	12300	14057	9959	7985	10881	9631	7693	7751
1934	7391	7075	14154	17678	14896	11564	11157	9181	11479	10102	7063	7669
1935	7485	10588	9998	26514	13174	24724	42276	17772	14738	19212	12675	12034
1936	9199	9442	10478	37892	59943	32995	20706	13545	14515	20676	14490	12876
1937	10043	9728	10443	13302	34567	35784	20681	13513	15017	19160	13218	11610
1938	10622	26745	62060	31146	74173	74538	57528	53052	34002	15268	15394	25950
1939	12724	13641	12618	10738	11821	10742	8053	9048	9769	19867	17484	12102
1940	9085	8523	9653	26336	55769	73837	55717	14663	12204	23615	16140	20013
1941	10854	13384	35124	71134	73612	68815	55586	38581	15775	17562	15166	30405
1942	11531	17686	46344	66286	74260	22031	41454	31871	24449	16740	15289	30167
1943	12387	19493	18866	63826	48925	66464	25253	15369	12089	23329	15747	29390
1944	12578	16605	13370	15104	24188	19157	9152	8709	11726	19112	15805	9061
1945	9034	14491	16091	13150	43727	20963	11269	11935	11454	19772	15786	14168
1946	10466	14230	61870	44985	17255	18809	13903	13465	10669	20825	16831	13914
1947	11755	11188	15135	11534	17492	19512	11823	9580	12959	19885	17545	14782
1948	9413	11052	9621	14862	10326	15218	23800	28361	21150	20607	17313	15090
1949	10428	10261	13795	11312	11865	41359	12463	12354	12313	19842	17578	15819
1950	10643	9952	9769	19363	34307	19972	19260	14429	13729	20791	16538	12895
1951	11650	46980	74574	56833	63031	28139	14311	16174	12523	24045	16718	22008
1952	12136	17205	36647	65682	69180	52762	60637	59160	35783	18614	16303	29541
1953	13705	17292	30502	71718	23031	19522	15449	25124	24877	22362	16724	30115
1954	12025	19448	13908	23247	52697	46323	38727	12210	14119	24677	16904	22586
1955	11826	16607	21715	18838	12756	10462	10343	11181	10439	19646	18085	13832
1956	9080	11566	73646	74895	67785	34190	18072	39178	20359	17400	15362	30385
1957	12841	18998	14092	13329	15378	43477	10927	19235	11446	24350	17173	20644
1958	15905	15733	23331	36867	74324	73776	73482	41979	30005	17300	17170	27518
1959	14874	17245	14454	21410	48073	15551	9705	10224	12427	23681	16989	9961
1960	9047	9765	9271	12791	26945	20731	11099	10567	12193	20657	17962	14152
1961	9915	12670	18279	12691	33719	17932	10185	10498	12099	20525	18967	13704
1962	11160	8363	16804	10046	46986	22814	12665	10774	12190	23030	17379	11588
1963	33072	15998	27782	18477	67992	25102	72765	26323	13917	24223	16610	30095
1964	12825	21302	13294	22450	13084	11143	9552	10633	10776	19872	17747	11699
1965	10679	15501	70833	74134	32643	19739	40230	17264	14992	22293	14681	29209
1966	12449	21228	13640	24695	22357	20752	13892	10170	12335	22697	16939	12910
1967	9862	15086	36923	40326	50816	52199	34327	43140	38218	14484	15821	27293
1968	14688	15712	14898	25315	56377	31820	10309	11237	11765	23576	16190	12711
1969	9938	12379	22647	74269	73865	43470	39655	44977	22058	14891	14129	28003
1970	11792	13061	53909	76414	69450	33466	10738	12621	12528	24835	16489	27983
1971	12855	19509	47190	46510	22433	41833	22116	27984	20999	22189	16965	27297
1972	13668	17699	15691	15611	17108	29396	10730	10543	12733	22743	16963	13347
1973	9606	20791	26139	72266	71690	49325	15312	16488	15661	22209	15354	17524
1974	13367	57050	64248	74582	39298	73686	60782	20655	19146	19845	17202	28629
1975	14685	19058	15080	14211	51568	69665	20178	28742	23665	19487	15758	28992
1976	15081	19361	15055	11010	12465	13533	9449	6015	8664	17587	12100	9453
1977	9798	8246	9757	9281	7971	8317	8957	5424	8766	8685	8382	7284
1978	6739	7052	15021	56869	44214	62204	33781	18590	15710	19890	16094	21262
1979	12336	14309	13533	21120	29018	24697	13666	14001	12570	20584	15969	11682
1980	10533	15724	20209	74150	74088	43158	16716	13897	12589	15911	13481	16533
1981	11746	12572	14892	20871	26415	25066	12689	9333	12790	19825	17254	14388
1982	10372	35224	73592	65876	73829	65932	74398	31157	20736	14654	13084	23423
1983	20670	37755	63327	70684	74852	77051	58049	54391	51633	25652	18473	25982
1984	18568	63897	75126	47542	33647	33877	12926	11985	11976	23403	15718	27802
1985	11034	24944	21228	13827	14945	13038	12012	10248	12309	19495	16669	13371
1986	11338	11029	17163	22530	78460	74228	18160	12627	12579	20890	14525	20440
1987	11655	11887	13404	13732	19274	22546	8011	10020	12824	19501	14931	8192
1988	7943	8328	17455	24968	13015	7730	10853	9099	11578	16641	9088	7806
1989	7519	9387	9915	12291	8817	45948	21162	13488	13522	20266	18100	11014
1990	10697	10899	9413	18417	13439	12072	11154	6731	8970	16422	12096	7801
1991	7479	7103	7275	7527	9104	28369	11492	6920	9376	18287	8692	7587
1992	7338	6946	6628	10407	27930	18127	11303	8939	12921	14078	9036	8101
1993	6877	6986	12724	50664	49135	36541	37346	26718	25990	19567	16308	22482
1994	12740	12700	15168	12776	21547	11455	12431	9740	9075	19434	19792	12076
1995	7899	8221	14845	73647	48587	76526	50292	66395	37981	17182	17991	22970
1996	15764	13674	22693	43935	74415	61011	32940	42027	14967	21466	15437	31186
1997	11364	17799	63196	78584	54329	22117	15933	11912	13661	24540	16347	29387
1998	12351	17439	19995	41264	74535	67804	45005	42741	64528	23498	20417	26570
1999	16196	26724	34934	40140	70926	58882	22601	18556	16589	21349	15722	25365
2000	11769	18367	14173	20943	71934	59461	17742	16031	11751	22747	16715	22073
2001	9115	13863	12600	17018	23790	22417	11094	9104	13168	19452	10883	9749
2002	8298	9702	29040	45136	18205	18881	15568	10960	10390	20089	18524	12954
2003	7112	10297	38484	60124	23915	21976	25299	36949	14217	24449	16291	20787
Avg.	11272	15865	24321	32876	38570	33729	23492	19152	16433	19593	15160	17916
Max	33072	63897	75126	78584	78460	77051	74398	66395	64528	25652	20417	31186
Min	6739	6946	6628	7527	7971	7730	7429	5424	8375	8685	7063	7284

Sacramento Flow at Freeport

Existing with Project Conditions **Flow in CFS**

Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	12070	12850	16704	14491	29912	27432	22273	49581	34795	18626	15418	23672
1923	11708	16685	26554	25347	17820	11440	21010	15018	12064	19950	15805	11522
1924	9162	9591	9040	12096	14672	9567	7429	6028	8745	14881	8479	7915
1925	7565	7560	12302	11997	59631	16768	22905	13143	11764	18325	13638	12519
1926	9041	8864	9362	17290	37340	12050	19689	10473	13137	20094	16880	8069
1927	8985	20984	18366	31546	74597	41692	42707	24261	18103	21955	16130	30325
1928	11656	17950	15017	23819	20989	73699	24016	10022	15427	24422	16840	22230
1929	10975	13813	11624	12573	16001	12065	7766	7555	10747	12461	7411	7993
1930	7671	7292	17937	20461	18102	29299	11793	9836	12953	17553	13428	10923
1931	9021	8457	8003	13113	11517	8437	9738	7228	8375	13135	7827	7487
1932	7440	7196	18786	20226	13744	12183	9160	12227	13177	13621	9202	11235
1933	9271	8474	10414	14278	12261	14035	9959	7905	10882	9574	7600	7751
1934	7391	7066	14103	17631	14852	11517	11157	9181	11479	9748	7292	7669
1935	7478	10560	9946	26469	13130	24674	42213	17696	14868	19182	12659	12034
1936	9199	9358	10478	37851	59367	32949	20646	13466	14435	20657	14469	12835
1937	10044	9719	10538	13261	34527	35736	20619	13433	15067	19144	13211	11610
1938	10560	26780	62017	30786	74168	74532	57465	52972	33922	15268	15394	25955
1939	12738	13668	12635	10696	11821	10101	7991	9113	9759	19872	17474	12303
1940	9085	8523	9671	26297	55470	73826	55655	14583	12204	23616	16169	20026
1941	10778	13415	34995	71073	73606	68766	55523	38501	15694	17562	15166	30405
1942	11489	17665	46210	66247	74255	21982	41392	31792	24369	16739	15289	30166
1943	12353	19494	18814	63540	48888	66414	25190	15289	12009	23426	15747	29388
1944	12544	16491	13341	15063	24150	19110	9090	8630	11726	19099	15801	9064
1945	9034	14433	16046	13156	43721	20915	11206	11857	11454	19758	15783	14168
1946	10475	13934	61842	44940	17255	18457	13842	13386	10819	20730	16831	13949
1947	11704	11135	15094	11493	17451	19434	11761	9584	12959	19885	17545	14791
1948	9385	11070	9596	14818	10327	15165	23746	28167	21074	20620	17301	15088
1949	10426	10206	13753	11271	11824	41297	12401	12275	12314	19842	17585	15799
1950	10643	9935	9727	19316	34266	19923	19198	14350	13729	20791	16534	12743
1951	9296	48015	74567	56784	62984	28086	14248	16095	12536	24040	16718	22008
1952	12100	17217	36664	65641	69126	52775	60574	59082	35703	18534	16222	29746
1953	13583	17192	30359	71673	22989	19473	15386	25045	24796	22362	16724	30115
1954	11991	19448	13908	23106	52638	46174	38665	12130	14127	24677	16904	22586
1955	11827	16584	21672	18797	12756	10413	10280	11102	10438	19646	18090	13812
1956	9080	11508	73625	74886	67746	34141	18009	39098	20279	17400	15362	30385
1957	12807	18972	14092	13287	15334	43214	10866	19157	11446	24350	17173	20659
1958	15824	15678	23288	36825	74318	73776	73474	41900	29925	17300	17090	27518
1959	14798	17284	14420	21339	47927	15502	9642	10144	12427	23705	16992	9929
1960	9012	9796	9262	12752	26906	20489	11099	10488	12193	20673	17950	14141
1961	9909	12614	18152	12653	33677	17883	10185	10503	12100	20525	18966	13702
1962	11125	8338	16655	10003	46915	22766	12603	10695	12189	23051	17379	11568
1963	32960	15945	27740	18291	67951	25053	72702	26244	13837	24309	16594	29938
1964	12739	21176	13257	22407	13044	11142	9489	10554	10777	19871	17753	12575
1965	9546	15470	70890	74129	32601	19691	40169	17190	14912	22352	14679	29209
1966	12414	21176	13600	24655	22317	20649	13817	10091	12486	22552	16939	13032
1967	9823	15026	36817	40286	50486	52152	34264	43060	38137	14404	15741	27561
1968	14473	15632	14898	25132	56324	31770	10248	11159	11805	23551	16187	12711
1969	9950	12326	22605	74259	73859	43421	39591	44897	21977	14891	14130	28002
1970	11791	13061	53626	76409	69409	33418	10675	12542	12533	24836	16489	28013
1971	12804	19484	47063	46472	22392	41699	22054	27905	20919	22188	16964	27294
1972	13665	17697	15649	15571	17069	29199	10668	10464	12733	22762	16966	13329
1973	9529	20648	26076	72173	71649	49276	15249	16409	15734	22168	15353	17505
1974	13333	56952	64115	74577	39257	73680	60719	20575	19066	19845	17122	28629
1975	14609	19057	15037	14171	51429	69609	20116	28662	23585	19487	15678	28992
1976	15065	19361	15055	10969	12181	13489	9386	6015	8664	17589	12096	9458
1977	9800	8193	9745	9241	7953	8337	8957	5424	8766	8685	8428	7284
1978	6739	7052	14981	56819	44045	62107	33719	18511	15630	19889	16094	21262
1979	12301	14281	13673	21079	28972	24649	13610	13923	12654	20584	16039	11950
1980	10533	15750	20165	74123	74083	43109	16659	13817	12509	15911	13141	16727
1981	11659	12574	14892	20643	26375	25016	12626	9333	12790	19825	17256	14414
1982	10374	35183	73584	65735	73824	65882	74390	31077	20656	14654	13084	23423
1983	20355	37703	63285	70644	74847	77045	57986	54311	51553	25652	18392	25982
1984	18492	63843	75121	47501	33608	33828	12863	11906	11976	23414	15718	27802
1985	11015	24833	21188	13785	14903	12997	11950	10248	12309	19495	16670	13259
1986	11262	11107	17120	22489	78455	74217	18098	12548	12579	20890	14536	20435
1987	11575	11929	13405	13690	19234	22498	7950	10041	12824	19492	14780	8192
1988	7943	8328	17413	24927	12996	7708	10790	9099	11578	16627	9087	7806
1989	7409	9330	9867	12243	8776	45908	21102	13589	13366	20364	18024	11150
1990	10633	10804	9643	18373	13397	12022	11154	6651	8967	16430	10972	7821
1991	7467	7052	7274	7517	9093	28348	11460	6871	9380	18750	8699	7587
1992	7218	6946	6587	10366	27891	18079	11303	8939	12921	14008	9028	8101
1993	6872	6884	12689	50624	49094	36482	37288	26120	25951	19566	16307	22480
1994	12675	12697	15168	12738	21508	11408	12432	9740	9075	19434	19792	12045
1995	7890	8165	14802	73637	48484	76520	50229	66315	37900	17059	17912	22970
1996	15683	13581	22576	44057	74410	60961	32876	41947	14887	21466	15436	31186
1997	11329	17777	63001	78579	54288	22068	15870	11832	13680	24540	16347	29387
1998	12317	17397	19953	41166	74527	67756	44942	42661	64447	23418	20337	26570
1999	16119	26670	34893	40099	70886	58833	22538	18476	16509	21349	15722	25255
2000	11691	18412	14173	20892	71884	59413	17678	15951	11751	22747	16715	22073
2001	9064	13884	12625	16976	23751	22370	11032	9109	13168	19452	10878	9649
2002	8298	9635	28987	45011	18102	18841	15506	10881	10322	20089	18546	12933
2003	7112	10313	38438	60085	23875	21928	25236	36870	14047	24587	16175	20927
Avg.	11192	15843	24284	32822	38515	33668	23439	19085	16409	19585	15138	17936
Max	32960	63843	75121	78579	78455	77045	74390	66315	64447	25652	20337	31186
Min	6739	6884	6587	7517	7953	7708	7429	5424	8375	8685	7292	7284

Sacramento Flow at Freeport

Difference (With Project minus Existing Conditions) **Flow in CFS**

Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	0	-54	-42	-41	-125	-48	-63	-79	-80	0	0	0
1923	-39	-24	-55	-39	0	0	-69	-79	0	0	0	-57
1924	0	-90	-42	-41	-40	0	0	2	0	-1	17	0
1925	0	-51	-40	-40	-39	0	-110	-79	-1	-460	305	-49
1926	0	-185	-41	-41	-52	0	-89	0	0	-7	47	0
1927	0	-56	-41	-42	-15	-45	-64	-80	-80	0	1	0
1928	-82	22	-42	-41	-39	-15	-61	-79	20	2	0	-2
1929	-11	-25	-43	-40	-40	-122	-63	-36	0	91	5	0
1930	0	0	-42	-38	-39	-47	-63	-80	0	-56	-2	0
1931	0	0	0	-45	0	-46	0	1	0	-4	0	0
1932	-6	0	-41	-37	-37	-47	0	-79	-80	-3	15	-2
1933	-2	0	-68	-79	-40	-22	0	-79	0	-57	-93	0
1934	0	-9	-51	-47	-45	-47	0	0	0	-354	229	0
1935	-7	-28	-52	-45	-43	-50	-63	-76	130	-30	-16	0
1936	0	-84	0	-41	-576	-46	-59	-79	-80	-19	-21	-41
1937	1	-9	95	-42	-40	-49	-62	-79	50	-16	-7	0
1938	-62	35	-43	-359	-5	-6	-63	-79	-80	0	0	5
1939	14	27	16	-42	0	-641	-62	66	-10	5	-11	201
1940	0	0	18	-39	-299	-10	-62	-79	0	2	30	13
1941	-76	31	-129	-61	-6	-48	-63	-79	-80	0	0	-1
1942	-42	-21	-135	-40	-5	-49	-63	-79	-80	0	0	-1
1943	-35	1	-52	-286	-38	-49	-63	-79	-80	98	0	-1
1944	-34	-114	-29	-41	-38	-48	-63	-79	0	-13	-4	4
1945	0	-58	-45	6	-6	-48	-62	-79	0	-14	-3	0
1946	9	-296	-28	-45	0	-352	-61	-79	150	-96	0	34
1947	-51	-53	-41	-41	-41	-79	-62	5	0	0	0	9
1948	-27	18	-26	-44	1	-53	-54	-195	-76	12	-12	-2
1949	-2	-54	-41	-41	-41	-63	-63	-79	0	0	6	-20
1950	0	-17	-41	-47	-41	-49	-62	-79	0	0	-5	-152
1951	-2354	1035	-8	-49	-47	-52	-63	-79	13	-5	0	0
1952	-36	12	17	-40	-53	13	-64	-79	-80	-80	-80	205
1953	-122	-100	-143	-45	-41	-49	-63	-80	-80	0	0	0
1954	-34	0	0	-141	-59	-149	-62	-80	8	0	0	0
1955	1	-23	-43	-41	0	-49	-63	-79	0	0	5	-20
1956	0	-58	-20	-9	-39	-49	-63	-79	-80	0	0	0
1957	-34	-26	0	-42	-44	-263	-62	-79	0	0	0	15
1958	-81	-54	-44	-41	-5	0	-8	-79	-80	0	-80	0
1959	-76	39	-35	-71	-146	-48	-63	-79	0	23	3	-32
1960	-35	31	-9	-40	-39	-242	0	-79	0	16	-12	-11
1961	-6	-56	-127	-38	-42	-49	0	5	0	-1	-1	-2
1962	-35	-25	-149	-43	-71	-48	-62	-79	-1	21	0	-20
1963	-113	-53	-42	-186	-40	-49	-63	-80	-80	86	-16	-156
1964	-86	-126	-37	-43	-41	0	-63	-79	1	-1	6	876
1965	-1133	-30	58	-6	-42	-49	-61	-75	-80	60	-1	0
1966	-35	-52	-40	-40	-40	-103	-75	-79	151	-145	0	123
1967	-39	-60	-107	-40	-330	-47	-63	-80	-81	-81	-80	269
1968	-215	-80	0	-183	-53	-49	-61	-77	40	-25	-3	0
1969	11	-53	-41	-10	-5	-49	-63	-80	-80	0	0	-1
1970	-1	0	-283	-5	-41	-49	-63	-79	5	1	0	31
1971	-50	-25	-128	-38	-41	-134	-62	-79	-80	0	0	-2
1972	-3	-2	-41	-40	-39	-197	-62	-79	0	19	3	-18
1973	-76	-143	-63	-93	-41	-49	-63	-79	73	-41	0	-19
1974	-34	-98	-132	-5	-41	-6	-63	-79	-80	0	-81	0
1975	-76	-1	-43	-40	-140	-57	-62	-79	-80	0	-81	0
1976	-16	0	0	-41	-284	-44	-63	0	0	2	-4	5
1977	2	-53	-12	-39	-18	19	0	0	-1	0	45	0
1978	0	0	-40	-50	-169	-97	-62	-79	-80	0	0	0
1979	-35	-29	140	-41	-45	-48	-56	-78	83	0	70	268
1980	0	26	-43	-27	-5	-49	-57	-79	-80	1	-341	194
1981	-87	2	0	-228	-40	-49	-63	0	0	0	2	26
1982	1	-41	-9	-141	-5	-49	-8	-79	-80	0	0	0
1983	-315	-52	-42	-41	-5	-6	-63	-79	-80	0	-80	0
1984	-76	-54	-5	-41	-40	-49	-63	-79	0	11	0	0
1985	-20	-111	-40	-42	-41	-41	-63	0	0	0	1	-112
1986	-76	78	-42	-41	-5	-11	-62	-79	0	0	11	-4
1987	-80	42	0	-42	-40	-48	-61	21	0	-9	-152	0
1988	0	0	-42	-41	-20	-22	-63	0	0	-14	-1	0
1989	-111	-56	-48	-47	-41	-39	-60	101	-156	98	-76	136
1990	-64	-95	230	-44	-42	-50	0	-79	-3	8	-1124	20
1991	-12	-51	-1	-9	-11	-20	-32	-48	3	463	7	0
1992	-120	0	-41	-40	-39	-48	0	0	0	-69	-8	0
1993	-6	-102	-35	-40	-40	-59	-58	-598	-40	-1	-1	-2
1994	-65	-4	0	-39	-39	-47	0	0	0	0	0	-31
1995	-9	-56	-44	-10	-103	-6	-64	-80	-81	-123	-78	0
1996	-81	-93	-117	122	-5	-49	-63	-80	-80	0	0	0
1997	-35	-23	-196	-5	-41	-49	-63	-79	19	0	0	0
1998	-34	-42	-41	-98	-8	-49	-63	-80	-80	-81	-81	0
1999	-76	-54	-41	-41	-41	-49	-63	-80	-80	0	0	-110
2000	-78	45	0	-51	-50	-48	-63	-80	0	0	0	0
2001	-51	20	25	-42	-39	-47	-61	6	0	0	-6	-100
2002	0	-66	-53	-125	-102	-40	-63	-79	-68	-1	22	-20
2003	0	16	-46	-39	-40	-48	-63	-79	-170	138	-116	140
Avg.	-80	-22	-38	-54	-55	-62	-53	-67	-24	-8	-23	19
Max	14	1035	230	122	1	19	0	101	151	463	305	876
Min	-2354	-296	-283	-359	-576	-641	-110	-598	-170	-460	-1124	-156

Exhibit WDCWA-103

Cumulative Conditions
And
Cumulative Conditions Without Project
CalSim II Modeling

Davis Woodland Project Diversion

Cumulative Condition **1000 AF**

Year Type	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
AN	1922	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	0.0	0.0	31.5
BN	1923	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
C	1924	4.7	3.2	2.6	2.5	2.3	3.0	0.0	0.0	0.0	0.0	0.0	4.8	22.9
D	1925	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
D	1926	4.7	3.2	2.6	2.5	2.3	3.0	3.7	0.0	0.0	0.0	0.0	4.8	26.6
W	1927	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	0.0	0.0	31.5
AN	1928	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	0.0	26.7
C	1929	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
D	1930	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
C	1931	4.7	3.2	2.6	2.5	2.3	3.0	0.0	0.0	0.0	0.0	0.0	4.8	22.9
D	1932	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	0.0	4.8	36.3
C	1933	0.0	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	26.9
C	1934	4.7	3.2	2.6	2.5	2.3	3.0	3.7	0.0	0.0	0.0	0.0	4.8	26.6
BN	1935	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	0.0	4.8	36.3
BN	1936	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	0.0	4.8	36.3
BN	1937	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
W	1938	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	4.9	4.9	0.0	41.4
D	1939	4.7	3.2	2.6	2.5	2.3	3.0	3.7	0.0	0.0	0.0	0.0	4.8	26.6
AN	1940	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	0.0	26.7
W	1941	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	4.9	0.0	36.4
W	1942	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	4.9	4.9	0.0	41.4
W	1943	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	0.0	0.0	31.5
D	1944	4.7	0.0	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	28.3
BN	1945	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	0.0	4.8	36.3
BN	1946	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
D	1947	4.7	3.2	2.6	2.5	2.3	3.0	3.7	0.0	0.0	0.0	0.0	4.8	26.6
BN	1948	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	0.0	4.8	36.3
D	1949	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
BN	1950	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	0.0	4.8	36.3
AN	1951	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	0.0	26.7
W	1952	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	4.9	4.9	0.0	41.4
W	1953	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	4.9	0.0	36.4
AN	1954	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	0.0	26.7
D	1955	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
W	1956	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	4.9	4.9	0.0	41.4
AN	1957	4.7	0.0	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	0.0	4.8	33.1
W	1958	4.7	3.2	2.6	2.5	2.3	0.0	3.7	4.9	4.8	4.9	4.9	0.0	38.4
BN	1959	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
D	1960	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
D	1961	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
BN	1962	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
W	1963	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	4.9	0.0	36.4
D	1964	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
W	1965	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	4.9	0.0	36.4
BN	1966	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
W	1967	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	4.9	4.9	0.0	41.4
BN	1968	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	4.9	4.8	36.4
W	1969	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	4.9	4.9	0.0	41.4
W	1970	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	4.9	0.0	31.7
W	1971	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	4.9	0.0	36.4
BN	1972	4.7	0.0	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	28.3
AN	1973	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	4.9	0.0	31.7
W	1974	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	4.9	4.9	0.0	41.4
W	1975	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	4.9	0.0	36.4
C	1976	4.7	3.2	2.6	2.5	2.3	3.0	3.7	0.0	0.0	0.0	0.0	4.8	26.6
C	1977	0.0	3.2	2.6	2.5	2.3	3.0	0.0	0.0	0.0	0.0	0.0	4.8	18.3
AN	1978	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	4.9	4.8	41.2
BN	1979	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	4.9	4.8	36.4
AN	1980	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	4.9	0.0	36.4
D	1981	4.7	0.0	2.6	2.5	2.3	3.0	3.7	0.0	0.0	0.0	0.0	4.8	23.5
W	1982	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	4.9	4.9	4.8	46.1
W	1983	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	4.9	4.9	0.0	41.4
W	1984	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	4.9	0.0	31.7
D	1985	4.7	3.2	2.6	2.5	2.3	3.0	3.7	0.0	0.0	0.0	0.0	4.8	26.6
W	1986	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	4.9	0.0	36.4
D	1987	4.7	0.0	2.6	2.5	2.3	3.0	3.7	0.0	0.0	0.0	0.0	4.8	23.5
C	1988	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
D	1989	4.7	3.2	2.6	2.5	2.3	3.0	3.7	0.0	0.0	0.0	0.0	4.8	26.6
C	1990	4.7	3.2	2.6	2.5	2.3	3.0	0.0	4.9	0.0	0.0	0.0	4.8	27.8
C	1991	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	31.5
C	1992	4.7	3.2	2.6	2.5	2.3	3.0	3.7	0.0	0.0	0.0	0.0	4.8	26.6
AN	1993	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	4.9	0.0	36.4
C	1994	4.7	3.2	2.6	2.5	2.3	3.0	0.0	4.9	0.0	0.0	0.0	4.8	27.8
W	1995	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	4.9	4.9	4.8	46.1
W	1996	0.0	0.0	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	4.9	0.0	28.6
W	1997	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	4.9	0.0	31.7
W	1998	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	4.9	4.9	0.0	41.4
W	1999	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	4.9	0.0	36.4
AN	2000	4.7	0.0	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	4.9	0.0	28.5
D	2001	4.7	0.0	2.6	2.5	2.3	3.0	3.7	0.0	0.0	0.0	0.0	4.8	23.5
D	2002	0.0	3.2	2.6	2.5	2.3	3.0	3.7	4.9	0.0	0.0	0.0	4.8	26.9
AN	2003	0.0	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	0.0	4.9	0.0	31.8
	Avg.	4.4	2.9	2.6	2.5	2.3	2.9	3.5	4.0	2.0	0.7	1.9	2.8	32.5
	Max	4.7	3.2	2.6	2.5	2.3	3.0	3.7	4.9	4.8	4.9	4.9	4.8	46.1
	Min	0.0	0.0	2.6	2.5	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.3

Year type is based on Sacramento River 40-30-30 index: Wet (W), Above Normal (AN), Below Normal (BN), Dry (D), Critical (C)
Shaded periods indicate that Term 91 diversion prohibition is in effect

Percent of time Term 91 curtailments are in effect

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2007 EIR	0%	3%	0%	0%	0%	1%	11%	22%	67%	95%	88%	10%
Updated	6%	10%	0%	0%	0%	1%	6%	17%	57%	85%	61%	41%

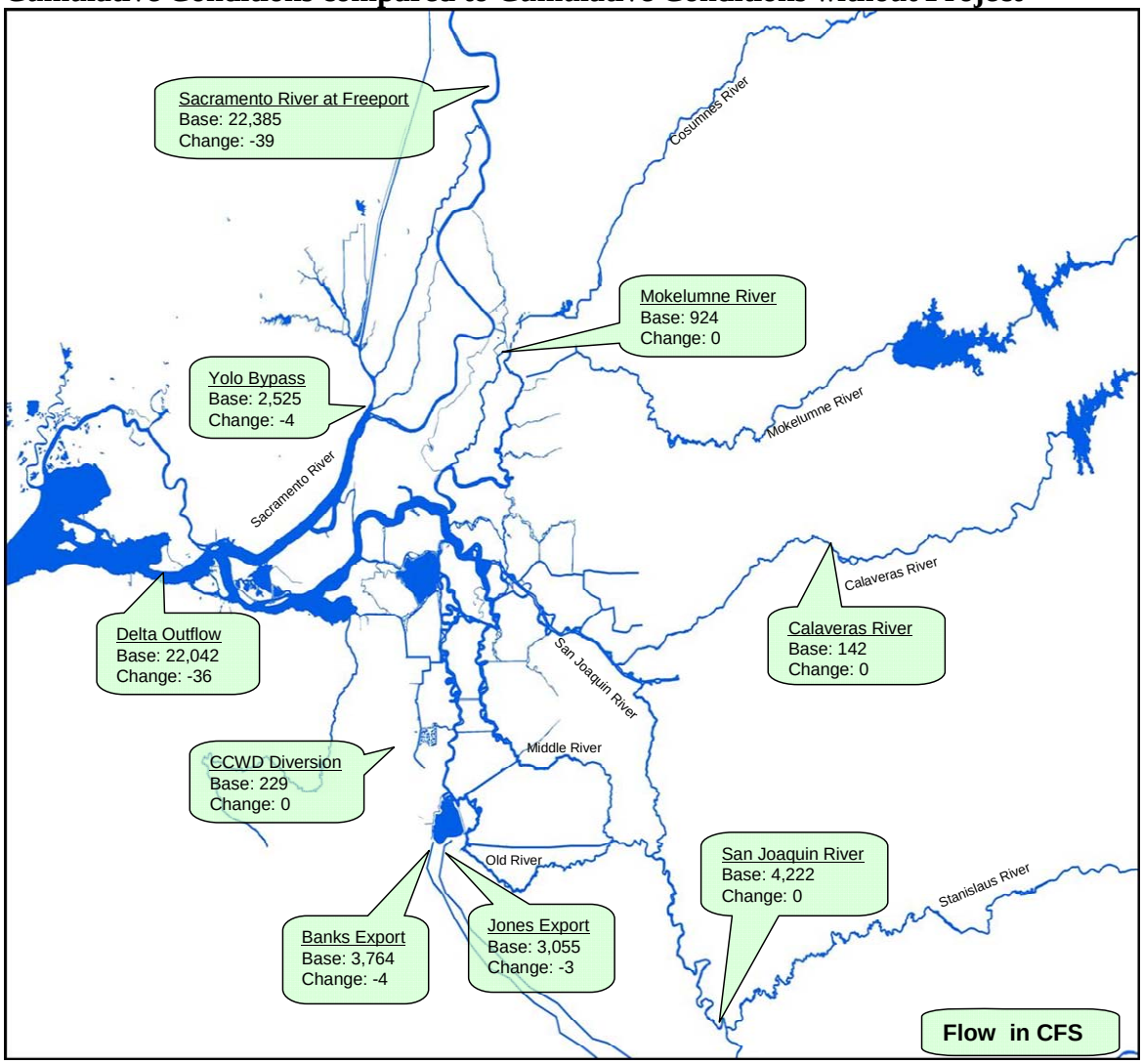
Summary Results,
Cumulative Conditions Compared to Cumulative Conditions Without Project

Items	Cumulative Condition without Project Conditions		Cumulative Condition		Difference: Cumulative Condition minus Cumulative Condition without Project Conditions	
	Long-Term	Dry Periods	Long-Term	Dry Periods	Long-Term	Dry Periods
DWWSP (1,000 AF/year)[1]						
Water Right diversion	0	0	33	28	33	28
Delta (1,000 AF/year) [1]						
Export at Banks Pumping Plant	2,731	1,620	2,729	1,618	-2	-2
Export at Tracy Pumping Plant	2,216	1,546	2,213	1,541	-2	-4
Total exports	4,947	3,166	4,942	3,159	-5	-7
Contra Costa Water District diversion	167	169	167	169	0	0
North Bay Aqueduct/City of Vallejo	75	52	75	52	0	0
Georgiana Slough	2,743	1,732	2,739	1,730	-4	-2
Delta Cross Channel	1,053	1,012	1,052	1,011	-1	-1
Total Delta inflow	21,873	10,129	21,842	10,112	-31	-18
Net Delta outflow	15,851	5,756	15,825	5,746	-26	-11
QWEST	2,069	266	2,069	269	0	3
Surplus Delta outflow	10,636	1,456	10,607	1,444	-30	-13
River Flows (cfs) [1]						
Trinity River below Lewiston	950	601	949	601	0	0
Sacramento River below Keswick	8,647	6,098	8,647	6,108	0	10
Sacramento River below NCP	9,179	6,114	9,182	6,126	3	11
Sacramento River below DWWSP	18,503	9,708	18,461	9,682	-42	-26
Sacramento River below Freeport	22,385	11,841	22,345	11,816	-39	-24
Feather River below Thermalito	4,389	2,177	4,389	2,178	1	1
Feather River at mouth	7,767	3,264	7,767	3,265	0	1
American River below Nimbus	3,325	1,562	3,326	1,563	0	1
American River at H Street	3,131	1,376	3,131	1,377	0	1
Calaveras River below Bellota Weir	142	9	142	9	0	0
San Joaquin River at Vernalis	4,422	1,877	4,422	1,877	0	0
Reservoir Carryover Storage (1,000 AF)[1]						
Trinity Lake	1,401	753	1,399	745	-2	-9
Whiskeytown Lake	233	224	233	223	0	-1
Lake Shasta	2,666	1,538	2,662	1,524	-4	-13
Folsom Lake	497	294	496	293	-1	-2
CVP total NOD storage	4,796	2,810	4,790	2,785	-7	-24
CVP San Luis Reservoir	199	256	200	258	0	2
Lake Oroville	1,832	1,061	1,826	1,057	-6	-4
SWP San Luis Reservoir	378	305	377	304	-1	-1
New Hogan Reservoir	146	80	146	80	0	0
New Melones Reservoir	1,276	628	1,276	628	0	0
CVP-SWP Deliveries (1,000 AF/year)[2]						
CVP NOD agricultural deliveries	218	38	218	37	-1	-1
CVP NOD M&I deliveries	215	157	215	155	0	-1
CVP SOD agricultural deliveries	883	188	881	183	-2	-5
CVP SOD M&I deliveries	117	88	117	88	0	0
SWP Table A deliveries	2,495	1,347	2,492	1,346	-3	-1
SWP Article 21 deliveries	59	73	60	73	1	0

[1] Dry periods are water-year based (Oct 1928 - Sep 1934, Oct 1975 - Sep 1977, and Oct 1986 - Sep 1992)

[2] Dry periods for CVP and SWP deliveries are contract-year based (CVP: Mar 1929 - Feb 1935, Mar 1976 - Feb 1978, and Mar 1987 - Feb 1993, SWP: Jan 1929 - Dec 1934, Jan 1976 - Dec 1977, Jan 1987 - Dec 1992).

Average annual Delta Flows,
Cumulative Conditions compared to Cumulative Conditions without Project



Delta Outflow

Cumulative Condition without Project Conditions **Flow in CFS**

Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	4000	4500	9187	12820	38616	27477	30117	56933	37119	8000	4000	13750
1923	5938	11250	29356	28653	15652	9606	29450	18586	6844	6791	4011	3604
1924	4000	4500	4500	8371	13420	9371	7208	4671	4000	4576	4600	3000
1925	3000	4374	8201	8458	70661	13536	30246	17365	5379	5000	4718	3099
1926	4000	4500	4500	14311	45685	12516	28153	9661	5625	5290	4233	3135
1927	4000	14175	14657	32374	121555	41650	53826	27655	13261	8000	4000	20156
1928	7656	15938	6588	21122	23059	82068	28705	11474	8529	10621	4000	11563
1929	5938	10625	4616	8841	12418	9013	8617	7100	7243	4000	4419	3000
1930	3000	4010	13113	19542	16885	29249	12846	9731	6719	5000	4591	3135
1931	4000	4500	4500	10267	8293	7908	7817	4680	4000	4000	4724	3000
1932	3000	4860	14463	17413	13950	10781	12465	14184	9920	5000	3556	3000
1933	5104	4500	4500	11976	7842	13657	9319	7547	7243	4000	4243	3000
1934	3000	4685	9488	14720	14980	10313	9673	7031	7100	4000	4083	3000
1935	3043	7030	3844	29107	10062	26544	56320	20169	8211	6500	4000	3000
1936	4275	4500	4669	41513	77919	32607	28934	17211	9243	6500	4000	3371
1937	4000	4500	4752	11345	46982	48139	29438	18381	11076	6500	4000	3000
1938	4000	17784	65477	29399	144905	166617	79357	68226	37036	8000	4000	20625
1939	7500	13734	4538	7122	8117	10355	10226	10019	5310	5235	4732	3000
1940	4000	4500	4500	34494	65564	110143	73504	18438	5968	10243	4000	11563
1941	5938	10625	37093	97455	117328	89010	79547	47744	13099	8000	4000	20938
1942	7656	14118	46253	78293	136637	23934	57009	40618	22485	8000	4000	21094
1943	7188	16250	15500	77404	55024	86076	35058	19362	7347	10756	4000	19375
1944	7500	12487	4748	11627	23663	18803	13677	10766	6508	5000	4027	3000
1945	4095	6097	12051	9479	52401	23439	17037	15053	7008	6544	4206	3430
1946	4000	6029	69838	46617	15036	19408	18165	16744	6365	7181	4000	3801
1947	4000	4500	8860	7765	14435	20070	12480	8436	7100	5000	4975	3738
1948	4000	4500	4500	13017	11145	13276	29056	29814	13753	6500	4000	3785
1949	4000	4500	7281	7624	9178	46472	13714	11897	6713	5000	4923	4586
1950	4000	4500	4500	19596	35650	16645	22405	15884	7445	6897	4000	3810
1951	4003	46070	98811	66754	69224	28473	19605	19886	6076	11207	4000	10781
1952	6563	10313	37422	82553	74024	62524	76060	73783	36956	10397	5336	20469
1953	8438	13257	28400	99275	21422	17459	20171	27578	20457	8000	4000	19688
1954	8125	15469	4500	23631	52502	45191	45196	13658	7322	11460	4000	11563
1955	6250	10313	13807	17381	8906	7886	12606	11458	6478	5000	4917	3000
1956	4246	4500	90726	160487	84550	37267	24148	45963	18835	8000	4000	20938
1957	7813	13626	4538	9578	16648	41239	15346	23034	6353	10362	4000	11875
1958	5938	10313	18226	39404	152575	116151	104980	54191	30285	8000	5462	18750
1959	8750	13510	4767	22592	49349	11865	11454	10375	6563	8646	4000	3489
1960	4000	4500	4500	9462	28754	18591	11708	10129	5818	5591	4687	3000
1961	4187	6835	8381	9736	33528	14164	8860	8371	7100	5414	5585	3965
1962	4000	4500	11886	5650	54055	20239	16390	14331	5877	7977	4000	3050
1963	28173	5490	23507	16304	73051	23834	98764	30404	8562	10633	4000	20078
1964	7813	15625	4520	21008	9619	7735	10356	10062	7041	5000	4353	3000
1965	4209	12058	83357	113528	33140	17489	51954	20675	9670	8704	4000	19922
1966	7813	15469	7548	24933	21104	18369	16149	9898	6422	8382	4000	3481
1967	4000	10111	33912	50244	52776	58747	59189	56765	41175	13798	4072	20313
1968	7656	13732	5263	23122	58288	30336	12445	11853	5511	9190	4000	3135
1969	4000	6600	14348	124836	131919	64325	59388	63262	31467	8000	4000	21875
1970	7188	14548	45727	207405	75624	36330	14330	14778	7264	11200	4000	18438
1971	8438	15313	50646	48050	19011	40262	26970	31507	14612	8000	4000	19219
1972	8281	14417	7197	11845	15721	27377	13017	10979	6010	9133	4000	3558
1973	4000	13175	21893	83724	88972	54741	20344	18885	9383	8492	4000	11719
1974	6250	50997	64744	131781	38833	107539	70494	24618	15123	8000	4912	19375
1975	7969	14455	5379	9624	56226	84745	27878	32827	20337	8000	4000	19688
1976	8125	15938	4500	7141	7990	10008	9878	4296	4000	4652	4232	3147
1977	5283	3500	4651	6701	7714	7239	7100	4000	4000	4000	4748	3000
1978	3357	5102	10788	67393	51037	68081	47816	24877	13017	8000	4000	11563
1979	5938	10625	4631	21812	34171	27330	20189	19701	8067	6500	4000	3146
1980	4000	9603	11541	107993	132115	61629	23475	19190	12045	8000	4000	11563
1981	6250	10313	5255	19364	20631	22803	15540	10380	6094	5000	4758	4061
1982	4000	26656	86589	75463	99166	82985	140920	46917	20195	8000	4000	19375
1983	14350	41563	82407	106681	178037	259317	89336	77151	70021	34925	14710	22659
1984	10479	79071	156721	63498	36638	34609	18704	14735	7700	10355	4000	19063
1985	8281	19192	12330	10291	11620	11833	13959	10448	6250	5000	4473	4247
1986	4000	4500	11356	22266	212825	145915	28190	19088	10097	8000	4000	18438
1987	8125	12610	4500	9716	16107	23110	9251	9885	6875	5000	4050	3000
1988	4000	4500	13077	26734	13310	6219	11307	6630	7100	4000	3646	3000
1989	3860	4170	5515	7843	8636	48656	20633	10814	5938	5563	4876	3608
1990	4000	4500	4549	14798	11400	11417	9713	5838	4000	4000	4381	3000
1991	3987	3500	4733	5427	7879	33964	10938	5020	4000	4726	4464	3000
1992	3549	4239	3500	9330	33368	16713	9527	6144	7100	4000	3344	3000
1993	4755	3500	8827	63621	55730	36179	41919	30552	22885	8000	4000	12500
1994	6250	10625	5241	9025	19574	8042	10886	7988	4000	4297	6057	3000
1995	3601	4209	8788	111131	45529	212866	69169	84157	40310	21742	8582	14375
1996	11563	12433	20419	47709	123046	68290	47873	48984	10826	8000	4000	21250
1997	7813	15625	77814	278491	71987	21741	20066	14490	7021	11228	4000	18750
1998	7813	15313	9716	48591	221178	81321	64848	59003	73119	27991	11633	18973
1999	8921	20249	30623	40235	93038	60117	31303	22556	10920	8228	4000	19922
2000	7500	15237	4538	21935	111221	63157	22965	19385	5750	10728	4000	11719
2001	5781	10469	4500	13274	24474	22821	12570	7922	7100	5000	4457	3000
2002	4000	5869	28020	49125	14232	17004	16734	12442	5016	5000	5816	3415
2003	4000	5267	35095	60843	22006	18323	28601	39702	6602	9851	4000	11563
Avg.	5945	11727	21711	42318	51604	42723	31044	22646	12541	7957	4532	9759
Max	28173	79071	156721	278491	221178	259317	140920	84157	73119	34925	14710	22659
Min	3000	3500	3500	5427	7714	6219	7100	4000	4000	4000	3344	3000

Delta Outflow

Cumulative Condition **Flow in CFS**

Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	4000	4500	9145	12780	38576	27428	30055	56854	37039	8000	4000	13750
1923	5938	11250	29300	28613	15652	9575	29383	18507	6845	6796	4010	3579
1924	4000	4500	4500	8330	13381	9371	7208	4564	4000	4620	4573	3000
1925	3000	4345	8191	8417	70625	13487	30184	17287	5379	5000	4726	3045
1926	4000	4500	4500	14269	45652	12516	28089	9792	5625	5269	4254	3135
1927	4000	14109	14610	32340	121281	41558	53761	27575	13180	8000	4000	20156
1928	7656	15938	6543	21082	23020	81925	28645	11396	8544	10624	4000	11563
1929	5938	10625	4606	8802	12378	9013	8554	7100	7243	4000	4423	3000
1930	3000	4013	13078	19500	16842	29209	12779	9648	6719	5000	4587	3135
1931	4000	4500	4500	10224	8313	7862	7817	4680	4000	4000	4728	3000
1932	3000	4856	14421	17375	13943	10781	12402	14106	9920	5000	3573	3000
1933	5084	4500	4500	11884	7799	13606	9319	7467	7243	4000	4247	3000
1934	3000	4686	9458	14682	14943	10313	9673	7031	7100	4000	4081	3000
1935	3000	7205	3823	29060	10032	26494	56260	20089	8211	6500	4000	3000
1936	4279	4500	4630	41429	77125	32560	28870	17131	9163	6500	4000	3348
1937	4000	4500	4766	11304	46941	48091	29375	18302	11113	6500	4000	3000
1938	4000	17657	65435	29137	144866	166569	79294	68146	36955	8000	4000	20625
1939	7500	13734	4538	7081	8117	10306	10164	10050	5303	5237	4728	3000
1940	4000	4500	4500	34455	65475	109910	73444	18360	5968	10255	4000	11563
1941	5938	10625	37009	97405	117302	88962	79484	47665	13019	8000	4000	20938
1942	7656	14118	46110	78254	136597	23886	56947	40539	22405	8000	4000	21094
1943	7188	16250	15438	77128	54986	86027	34995	19282	7267	10875	4000	19375
1944	7500	12487	4737	11586	23624	18755	13615	10687	6508	5000	4031	3000
1945	4086	6039	12007	9435	52362	23393	16975	14974	7206	6500	4217	3347
1946	4000	6007	69794	46577	15036	19097	18104	16665	6515	7081	4000	3808
1947	4000	4500	8820	7724	14394	20031	12415	8440	7100	5000	4976	3735
1948	4000	4500	4500	12974	11145	13225	28997	29735	13666	6500	4000	3785
1949	4000	4500	7249	7583	9137	46424	13651	11818	6753	5000	4921	4596
1950	4000	4500	4500	19550	35605	16597	22345	15805	7368	6959	4000	3791
1951	4000	45875	98424	66583	69187	28424	19542	19806	6089	11203	4000	10781
1952	6563	10313	37299	82515	73972	62471	75997	73704	36876	10316	5256	20625
1953	8438	13257	28233	99216	21381	17410	20108	27498	20377	8000	4000	19688
1954	8125	15469	4500	23515	52443	44980	45134	13579	7328	11464	4000	11563
1955	6250	10313	13764	17340	8906	7854	12543	11379	6478	5000	4911	3000
1956	4240	4500	90591	160403	84478	37219	24085	45883	18755	8000	4000	20938
1957	7813	13626	4538	9536	16607	40976	15284	22956	6364	10363	4000	11875
1958	5938	10313	18184	39350	152416	116152	104918	54112	30205	8000	5382	18750
1959	8750	13510	4754	22480	49196	11816	11391	10296	6563	8663	4000	3491
1960	4000	4500	4500	9422	28715	18330	11875	10049	5818	5600	4682	3000
1961	4196	6786	8140	9696	33479	14115	8860	8376	7100	5416	5581	3960
1962	4000	4500	11855	5611	53799	20195	16327	14331	5877	7978	4000	3052
1963	28077	5363	23470	16261	72587	23787	98700	30324	8482	10718	4000	19922
1964	7813	15625	4505	20968	9593	7704	10334	9983	7071	5000	4349	3000
1965	4207	12005	83084	113489	33099	17440	51891	20595	9590	8764	4000	19844
1966	7813	15469	7505	24892	21063	18282	16079	9819	6422	8402	4000	3473
1967	4000	10058	33813	50204	52518	58699	59126	56685	41095	13718	4000	20469
1968	7500	13732	5263	22987	58236	30288	12384	11775	5536	9185	4000	3135
1969	4000	6569	14306	124620	131888	64276	59324	63183	31387	8000	4000	21875
1970	7188	14548	45470	207366	75584	36282	14267	14699	7283	11196	4000	18438
1971	8438	15313	50518	48011	18970	40108	26908	31428	14531	8000	4000	19219
1972	8281	14417	7155	11805	15682	27183	12955	10900	6010	9151	4000	3552
1973	4000	13084	21851	83661	88931	54693	20282	18806	9383	8499	4000	11719
1974	6250	50956	64553	131741	38792	107490	70431	24539	15043	8000	4831	19375
1975	7969	14455	5364	9584	56075	84631	27816	32747	20257	8000	4000	19688
1976	8125	15938	4500	7100	7990	9960	9815	4296	4000	4656	4231	3147
1977	5273	3500	4667	6663	7714	7239	7100	4000	4000	4000	4652	3000
1978	3555	4560	11014	67273	50744	67563	47752	24797	12934	8000	4000	11563
1979	5938	10625	4617	21773	34105	27283	20129	19621	8150	6500	4000	3094
1980	4000	9529	11504	107703	132192	61586	23412	19111	11993	8000	4000	11563
1981	6250	10313	5255	19326	20588	22623	15478	10380	6094	5000	4759	4063
1982	4000	26532	86439	75416	99126	82930	140858	46837	20114	8000	4000	19375
1983	14105	41506	82357	106640	177997	259268	89201	77072	69941	34845	14630	22659
1984	10403	79018	156679	63457	36599	34561	18642	14655	7700	10362	4000	19063
1985	8281	19139	12289	10250	11579	11786	13897	10447	6406	5000	4441	4224
1986	4000	4500	11314	22226	212779	145844	28127	19009	10045	8000	4000	18438
1987	8125	12610	4500	9674	16067	23062	9188	9907	6875	5000	4081	3000
1988	4000	4500	13035	26695	13310	6219	11245	6551	7100	4000	3651	3000
1989	3855	4150	5516	7798	8636	48618	20573	10814	5938	5565	4875	3588
1990	4000	4500	4529	14758	11400	11368	9712	5759	4000	4012	4399	3000
1991	3968	3500	4742	5376	7896	33914	10873	4939	4000	4745	4453	3000
1992	3557	4209	3500	9312	33327	16664	9501	6144	7100	4000	3382	3000
1993	4744	3500	8871	63585	55692	35972	41863	29850	22858	8000	4000	12500
1994	6250	10625	5241	8986	19534	7994	10887	7910	4000	4312	6046	3000
1995	3583	4418	8442	110780	45418	212814	69103	84076	40227	21659	8500	14375
1996	11563	12433	20376	47665	123020	68239	47809	48904	10745	8000	4000	21250
1997	7813	15625	77609	278451	71945	21691	20003	14411	7041	11223	4000	18750
1998	7813	15313	9674	48520	221019	81271	64785	58923	73037	27910	11552	18972
1999	8844	20194	30580	40193	92996	60067	31240	22476	10839	8281	4000	19922
2000	7500	15237	4538	21879	110963	63110	22901	19304	5750	10734	4000	11719
2001	5781	10469	4500	13231	24433	22773	12508	7941	7100	5000	4457	3000
2002	4000	5868	27970	49084	14232	16949	16672	12364	4911	5051	5797	3338
2003	4000	5535	34539	60695	21963	18272	28535	39622	6668	9842	4000	11563
Avg.	5938	11711	21654	42253	51537	42651	30990	22576	12522	7958	4524	9756
Max	28077	79018	156679	278451	221019	259268	140858	84076	73037	34845	14630	22659
Min	3000	3500	3500	5376	7714	6219	7100	4000	4000	4000	3382	3000

Delta Outflow **Flow in CFS**

Difference (Cumulative minus Cumulative without Project Conditions)

Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	0	0	-42	-40	-41	-48	-62	-79	-80	0	0	0
1923	0	0	-56	-40	0	-32	-67	-78	1	5	-1	-24
1924	0	0	0	-41	-39	0	0	-107	0	44	-27	0
1925	0	-29	-10	-41	-35	-49	-62	-77	0	0	8	-54
1926	0	0	0	-42	-33	0	-64	131	0	-21	21	0
1927	0	-65	-47	-34	-274	-92	-64	-80	-80	0	0	0
1928	0	0	-45	-40	-39	-143	-60	-78	15	2	0	0
1929	0	0	-11	-39	-40	0	-63	0	0	0	4	0
1930	0	3	-35	-42	-43	-39	-67	-83	0	0	-4	0
1931	0	0	0	-43	19	-46	0	0	0	0	4	0
1932	0	-4	-42	-38	-7	0	-62	-78	0	0	17	0
1933	-19	0	0	-92	-43	-51	0	-80	0	0	4	0
1934	0	1	-30	-38	-37	0	0	0	0	0	-1	0
1935	-43	176	-21	-48	-29	-50	-60	-80	0	0	0	0
1936	4	0	-39	-84	-794	-47	-63	-80	-81	0	0	-23
1937	0	0	14	-42	-41	-48	-63	-79	36	0	0	0
1938	0	-126	-41	-262	-39	-49	-63	-79	-80	0	0	0
1939	0	0	0	-41	0	-49	-62	32	-7	3	-4	0
1940	0	0	0	-39	-88	-233	-59	-78	0	11	0	0
1941	0	0	-84	-50	-26	-49	-63	-79	-80	0	0	0
1942	0	0	-143	-39	-40	-48	-62	-79	-80	0	0	0
1943	0	0	-61	-276	-38	-49	-63	-80	-80	119	0	0
1944	0	0	-11	-41	-39	-48	-63	-79	0	0	4	0
1945	-9	-58	-44	-44	-39	-46	-62	-78	198	-44	12	-84
1946	0	-22	-44	-40	0	-311	-60	-79	150	-100	0	6
1947	0	0	-40	-41	-41	-39	-65	4	0	0	1	-3
1948	0	0	0	-42	0	-51	-59	-79	-86	0	0	0
1949	0	0	-32	-41	-41	-48	-63	-79	40	0	-2	10
1950	0	0	0	-46	-45	-48	-60	-79	-78	63	0	-19
1951	-3	-195	-387	-170	-37	-49	-63	-79	12	-3	0	0
1952	0	0	-123	-39	-52	-53	-63	-79	-80	-81	-80	156
1953	0	0	-167	-59	-41	-49	-63	-79	-80	0	0	0
1954	0	0	0	-116	-60	-210	-62	-80	7	4	0	0
1955	0	0	-44	-40	0	-32	-63	-79	0	0	-5	0
1956	-6	0	-135	-85	-72	-49	-63	-79	-80	0	0	0
1957	0	0	0	-42	-40	-263	-62	-79	11	1	0	0
1958	0	0	-42	-54	-160	1	-63	-79	-80	0	-80	0
1959	0	0	-13	-112	-152	-49	-63	-79	0	17	0	2
1960	0	0	0	-40	-39	-261	167	-79	0	9	-5	0
1961	9	-50	-241	-41	-49	-49	0	5	0	1	-4	-5
1962	0	0	-32	-39	-256	-44	-63	0	0	2	0	1
1963	-96	-127	-37	-42	-463	-47	-64	-80	-80	85	0	-156
1964	0	0	-15	-40	-26	-31	-22	-79	31	0	-3	0
1965	-2	-54	-273	-39	-41	-49	-63	-79	-80	60	0	-78
1966	0	0	-43	-41	-41	-88	-71	-79	0	20	0	-8
1967	0	-53	-98	-40	-258	-48	-63	-80	-81	-80	-72	156
1968	-156	0	0	-135	-52	-49	-62	-78	25	-5	0	0
1969	0	-32	-42	-216	-31	-49	-63	-80	-80	0	0	0
1970	0	0	-257	-38	-41	-49	-63	-79	19	-4	0	0
1971	0	0	-129	-39	-41	-154	-62	-78	-80	0	0	0
1972	0	0	-42	-40	-40	-194	-62	-79	0	19	0	-7
1973	0	-91	-42	-63	-41	-49	-62	-79	0	7	0	0
1974	0	-41	-191	-40	-41	-49	-63	-79	-80	0	-80	0
1975	0	0	-15	-40	-151	-114	-62	-80	-80	0	0	0
1976	0	0	0	-40	0	-49	-62	0	0	4	-1	0
1977	-10	0	15	-39	0	0	0	0	0	0	-97	0
1978	198	-543	226	-120	-293	-518	-64	-80	-83	0	0	0
1979	0	0	-14	-38	-65	-47	-60	-80	83	0	0	-53
1980	0	-75	-37	-291	77	-44	-63	-79	-52	0	0	0
1981	0	0	0	-38	-43	-180	-62	0	0	0	1	3
1982	0	-123	-151	-47	-41	-55	-63	-79	-80	0	0	0
1983	-245	-57	-49	-41	-41	-48	-135	-79	-80	-80	-80	0
1984	-76	-53	-42	-41	-39	-49	-63	-79	0	7	0	0
1985	0	-53	-42	-41	-41	-47	-62	0	156	0	-32	-24
1986	0	0	-42	-40	-46	-71	-63	-79	-52	0	0	0
1987	0	0	0	-42	-40	-48	-63	22	0	0	31	0
1988	0	0	-41	-39	0	0	-63	-79	0	0	5	0
1989	-5	-21	1	-46	0	-39	-59	0	0	2	-1	-20
1990	0	0	-21	-40	0	-49	0	-79	0	12	18	0
1991	-19	0	8	-51	17	-50	-64	-81	0	20	-11	0
1992	7	-30	0	-18	-41	-50	-26	0	0	0	39	0
1993	-11	0	44	-36	-38	-207	-56	-702	-27	0	0	0
1994	0	0	0	-39	-40	-48	1	-78	0	14	-11	0
1995	-18	209	-346	-352	-111	-51	-66	-81	-82	-83	-83	0
1996	0	0	-43	-43	-26	-50	-64	-81	-80	0	0	0
1997	0	0	-205	-40	-42	-50	-63	-79	20	-5	0	0
1998	0	0	-42	-71	-158	-49	-64	-80	-81	-81	-81	-1
1999	-77	-54	-43	-42	-42	-50	-64	-80	-80	53	0	0
2000	0	0	0	-56	-258	-47	-64	-80	0	6	0	0
2001	0	0	0	-43	-41	-48	-62	19	0	0	-1	0
2002	0	-2	-51	-41	0	-55	-61	-78	-104	51	-19	-77
2003	0	269	-556	-148	-43	-51	-66	-81	66	-9	0	0
Avg.	-7	-16	-57	-65	-67	-71	-54	-69	-19	1	-8	-4
Max	-96	-53	-42	-40	-158	-48	-63	-81	-81	-80	-80	0
Min	0	0	0	-51	0	0	0	0	0	0	39	0

Sacramento Flow at Freeport

Cumulative Condition without Project Conditions **Flow in CFS**

Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	12251	13078	17246	14676	30097	27700	22287	49387	34672	18583	15537	23885
1923	11991	17383	26738	25567	17621	11204	20785	14962	11909	20355	15855	11539
1924	9366	10006	9234	12485	15133	8936	7217	5818	8757	15149	7827	7804
1925	7464	7841	12955	12236	58910	17172	23820	13209	11535	16904	16314	11146
1926	9030	9335	9570	17756	36998	12569	21321	9706	13609	19336	14907	11963
1927	8982	21920	18641	31520	74791	41553	42957	24103	18041	22229	16802	30132
1928	11633	18835	15446	24013	21409	73807	24467	10070	15640	24408	17083	21523
1929	11083	13644	11909	12779	16249	12120	7978	7613	10856	12415	7636	7866
1930	7660	7303	17534	20616	18252	29617	11937	9897	12356	16660	13460	10877
1931	9019	8625	7980	13646	11558	8692	9696	7095	8438	15047	8106	7380
1932	7381	7213	19547	20511	13795	12248	9098	12316	14288	13459	9757	12191
1933	9300	8469	10893	14775	12402	14073	9079	8138	11108	9861	7636	7643
1934	7303	7255	14562	18067	15489	11887	11157	9182	11606	9238	7720	7424
1935	7546	11369	10287	26828	13450	25173	42734	17721	14698	18847	12921	11962
1936	9192	9503	11951	38175	57709	33171	20915	13510	14419	20649	14457	12471
1937	10276	9715	11704	13794	34798	36168	20934	13331	15300	18830	13135	11636
1938	10783	25776	62440	30067	74371	74739	57654	52784	33795	14633	14119	27289
1939	13204	14552	13261	10864	11804	9728	8102	9257	9965	20287	17861	9070
1940	9080	8702	9363	26747	55248	74086	56278	14546	12177	23451	16595	21335
1941	10955	13268	33669	70751	73798	68977	56005	38517	15534	17661	15365	30495
1942	12379	17440	45052	66362	74474	22265	41982	31834	24176	16702	15489	30258
1943	12588	19150	19244	62620	49028	66695	25276	15207	11915	23619	15941	29523
1944	11909	15223	13637	15270	24561	19241	9347	8797	11713	18796	14921	10382
1945	9149	14743	16867	13217	43773	21276	11216	11858	11239	19926	16153	12560
1946	10769	14682	62580	45244	16846	19124	13772	13375	10665	21546	17057	13759
1947	10601	10572	15085	11629	17781	19661	11924	9687	12943	20184	18071	14468
1948	9062	11199	9497	15012	10336	15619	24097	27886	19885	21296	17718	14208
1949	11384	10171	14272	11258	13029	41094	12368	12153	12291	20086	18213	16047
1950	11178	9410	11775	19536	34318	20227	18661	14347	13586	20536	15619	13346
1951	12067	46843	74688	56925	63182	27957	14069	15975	12345	23964	17003	22188
1952	12096	17244	36876	65757	69233	53073	60711	58903	35626	17992	15911	28868
1953	13596	16638	32089	71972	23495	20986	15337	23760	24610	22601	16992	30435
1954	11722	19359	12066	24345	53010	46100	38918	12166	14299	24454	17147	22799
1955	11222	16240	22581	18673	12669	10543	10067	10756	10527	19955	17765	9626
1956	9229	11954	73958	75137	67919	34128	18214	39081	20154	17505	15558	30458
1957	13061	18702	13992	13610	16853	41372	11112	19181	11265	24763	17445	21466
1958	14941	15868	23533	36902	74521	73978	73712	41801	29603	17243	16679	28238
1959	14234	16914	14141	22394	47425	15663	9372	9800	12696	23889	17461	10918
1960	8973	8783	8886	13339	27085	20787	10908	10572	12224	21148	18279	11263
1961	9825	13177	18996	13105	33774	18150	10228	10539	12278	20925	19281	14801
1962	10912	10746	16915	10400	46009	21990	12607	13243	11481	23216	17609	12224
1963	33445	15959	27999	16289	64769	25420	72946	26124	13672	24487	16784	29919
1964	11776	21492	13364	22717	13117	10851	9661	10710	10728	20164	15524	9963
1965	9122	16195	73702	74322	32713	19912	40473	17116	14833	21653	14866	29421
1966	12676	21129	13938	24860	22868	20433	13910	10222	12324	23104	17256	13552
1967	9224	15561	34698	40615	50481	52468	34729	42832	37897	14232	14997	29110
1968	13552	15542	15322	24569	56414	32326	9883	10798	11541	24195	16438	12710
1969	9281	12503	21929	74415	74082	43606	39823	44669	21880	14871	13975	29686
1970	12292	15109	48565	76611	69557	33588	10315	12164	12258	24926	16771	28648
1971	13084	19372	47943	46455	22334	41205	22054	27987	20793	22445	17257	27074
1972	13518	17208	16194	15895	16615	29256	10920	10609	11842	24082	17237	12927
1973	9827	20526	25710	72363	71833	49519	14982	16339	15504	22501	15627	20209
1974	11043	56468	63901	74768	39367	73893	60848	20498	18978	19988	16733	29449
1975	14164	18618	14791	13557	50627	70199	20191	28385	23460	19637	15219	29881
1976	14531	18947	12925	11548	12469	14421	9716	6163	8855	16864	12491	11627
1977	8656	8097	8483	9621	8192	8136	8930	5586	9264	8675	7659	7202
1978	6551	7132	15625	56608	44228	61024	34181	17893	15339	19983	16260	21467
1979	12281	14313	13732	21694	29347	24959	13886	13879	14291	20925	16101	12071
1980	10593	14535	20171	74312	74299	43346	16858	13764	12389	16005	15200	17480
1981	10964	13701	15406	20928	24531	22991	12822	9379	12267	20055	18036	14391
1982	11188	34315	73785	65298	74047	66132	74613	30941	20505	14637	13310	23644
1983	18930	36263	64093	70738	75067	77252	58500	54117	51144	24537	18453	26210
1984	17972	64618	75315	47542	33724	33974	12752	11816	13560	23650	15962	26023
1985	11530	25241	21442	13936	15092	13302	11979	10179	12321	19830	17288	14194
1986	11170	11329	17136	22160	78629	74426	18235	11997	12251	21046	15429	20861
1987	10995	12333	13394	13818	19624	22908	8080	9959	13023	19181	9286	8764
1988	7934	8511	18096	25454	13068	7769	11106	7486	11711	16125	8477	7550
1989	7421	9770	10253	12410	8965	46094	21564	13339	13553	20870	18560	11151
1990	10081	9097	11148	18942	13750	12203	11230	6960	9129	17094	9886	7916
1991	7377	6957	7321	7561	9274	29034	11617	6953	9384	18132	8501	7474
1992	7631	7158	7017	10659	28403	18492	11151	8946	13363	13206	10706	8131
1993	8300	6986	13352	50577	49244	35735	37647	27350	25730	19720	16527	23047
1994	12288	13106	15731	13107	21935	11470	12016	9356	9180	19775	20064	12079
1995	8831	8046	15207	73785	47305	76791	50507	66349	37658	16792	17516	23825
1996	14984	12359	24276	44135	74611	61158	33155	42136	14726	21456	15661	31405
1997	11606	17504	62320	78778	54301	22223	16041	11976	12620	24574	16163	29174
1998	11917	16969	18952	42426	74753	67963	45577	43128	64098	22803	19791	26182
1999	16218	26946	35014	40478	70425	59306	23036	18367	16418	21850	16015	25650
2000	11639	18249	14098	21661	71244	59666	18136	15829	11606	22418	16952	22305
2001	9394	13571	13456	16590	24003	22255	11250	9044	13206	19535	9342	9078
2002	8068	10024	28803	45711	18226	19049	15599	10907	10514	20396	19169	13769
2003	10528	9380	35231	59359	25125	22383	24601	36772	13383	24724	17286	20977
Avg.	11183	15853	24409	32998	38559	33789	23583	19038	16359	19628	15173	18045
Max	33445	64618	75315	78778	78629	77252	74613	66349	64098	24926	20064	31405
Min	6551	6957	7017	7561	8192	7769	7217	5586	8438	8675	7636	7202

Sacramento Flow at Freeport

Cumulative Condition **Flow in CFS**

Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	12176	13025	17205	14635	30056	27652	22225	49308	34592	18583	15537	23885
1923	11971	17352	26682	25527	17621	11155	20718	14883	11910	20361	15855	11470
1924	9237	9970	9193	12444	15093	8936	7216	5817	8757	15226	7892	7796
1925	7417	7785	12913	12195	58875	17123	23758	13131	11535	16852	16327	10969
1926	9030	9244	9527	17714	36965	12544	21257	9837	13602	19312	14928	11963
1927	8982	21855	18593	31486	74780	41462	42893	24023	17961	22230	16803	30133
1928	11616	18810	15401	23973	21370	73797	24406	9991	15655	24410	17083	21524
1929	10986	13677	11862	12740	16209	12120	7915	7578	10856	12491	7641	7866
1930	7660	7303	17488	20575	18209	29577	11870	9814	12301	16561	13456	10788
1931	9019	8625	7980	13603	11577	8646	9696	7096	8438	15047	8106	7380
1932	7369	7213	19506	20473	13694	12261	9036	12238	14246	13451	9758	12191
1933	9300	8469	10815	14682	12359	14022	9079	8059	11108	9859	7640	7643
1934	7303	7251	14517	18028	15452	11840	11157	9182	11606	9221	7720	7424
1935	7209	11355	10228	26781	13404	25122	42674	17641	14698	18847	12923	11962
1936	9192	9449	11893	38091	57000	33124	20852	13430	14339	20649	14456	12405
1937	10239	9661	11766	13752	34757	36119	20871	13252	15344	18830	13135	11636
1938	10720	25650	62399	29805	74366	74733	57591	52704	33714	14633	14119	27289
1939	13127	14498	13261	10823	11802	9678	8040	9289	9958	20290	17857	8888
1940	9080	8702	9319	26708	55159	74075	56217	14467	12177	23456	16596	21315
1941	10879	13287	33584	70699	73793	68928	55942	38438	15454	17661	15365	30495
1942	12345	17445	44909	66323	74469	22217	41919	31754	24096	16702	15489	30258
1943	12553	19149	19182	62344	48990	66646	25213	15127	11835	23766	15941	29523
1944	11888	15126	13606	15229	24522	19193	9284	8718	11712	18789	14920	10371
1945	9149	14685	16823	13174	43734	21228	11155	11780	11437	19873	16162	12321
1946	10767	14660	62536	45204	16703	18812	13710	13296	10815	21447	17057	13777
1947	10601	10479	15044	11588	17740	19617	11861	9693	12943	20184	18072	14459
1948	9062	11107	9459	14969	10318	15568	24037	27807	19798	21297	17675	14208
1949	11384	10117	14230	11217	12988	41045	12305	12073	12331	20086	18212	16076
1950	11054	9350	11683	19490	34272	20179	18601	14268	13505	20587	15607	13291
1951	12032	46648	74674	56884	63140	27908	14006	15896	12357	23965	17003	22188
1952	12062	17216	36753	65718	69181	53020	60648	58824	35545	17912	15830	29024
1953	13560	16521	31938	71912	23453	20937	15274	23681	24530	22601	16991	30435
1954	11687	19359	12104	24229	52951	45890	38856	12086	14305	24453	17147	22805
1955	11201	16236	22537	18633	12669	10493	10004	10676	10551	19955	17721	9547
1956	9229	11850	73941	75131	67879	34079	18151	39001	20074	17505	15558	30458
1957	13027	18675	13992	13568	16810	41110	11050	19102	11276	24764	17446	21465
1958	14816	15818	23491	36847	74513	73978	73704	41722	29523	17243	16599	28238
1959	14157	16953	14105	22282	47273	15615	9309	9721	12696	23893	17461	10923
1960	8973	8760	8860	13299	27046	20526	11074	10493	12224	21157	18274	11312
1961	9808	13116	18756	13065	33725	18101	10228	10544	12278	20924	19277	14787
1962	10919	10737	16872	10361	45753	21945	12545	13243	11480	23218	17609	12228
1963	33348	15832	27962	16246	64306	25373	72883	26044	13592	24572	16725	29762
1964	11760	21482	13322	22676	13077	10803	9639	10631	10759	20164	15502	9952
1965	9122	16141	73667	74317	32671	19864	40410	17036	14753	21714	14866	29362
1966	12643	21103	13895	24819	22827	20345	13840	10143	12324	23124	17256	13528
1967	9224	15508	34600	40574	50223	52420	34666	42752	37817	14152	14916	29269
1968	13381	15471	15322	24457	56362	32278	9821	10720	11566	24196	16438	12710
1969	9203	12450	21887	74405	74077	43556	39760	44590	21800	14871	13975	29686
1970	12215	15109	48308	76606	69516	33540	10253	12085	12277	24929	16771	28692
1971	13030	19342	47814	46416	22293	41051	21991	27909	20713	22445	17257	27071
1972	13511	17207	16152	15855	16576	29062	10858	10530	11842	24100	17237	12907
1973	9749	20436	25668	72299	71792	49471	14920	16259	15504	22508	15627	20253
1974	10981	56427	63710	74763	39326	73887	60785	20419	18898	19988	16653	29449
1975	14087	18649	14749	13517	50477	70137	20129	28305	23379	19637	15219	29881
1976	14454	18949	12945	11507	12466	14373	9654	6164	8855	16858	12490	11619
1977	8685	8105	8493	9580	8174	8199	8930	5586	9001	8665	7822	7202
1978	6993	7132	15587	56488	43932	60550	34119	17813	15256	19985	16262	21470
1979	12191	14352	13695	21655	29281	24912	13826	13800	14373	20924	16101	11921
1980	10593	14460	20133	74300	74294	43298	16795	13684	12309	16005	15200	17494
1981	10884	13674	15406	20888	24489	22811	12760	9380	12267	20055	18037	14398
1982	11188	34192	73777	65250	74041	66083	74605	30862	20425	14637	13310	23644
1983	18678	36206	64052	70698	75061	77246	58392	54038	51064	24457	18373	26210
1984	17896	64565	75310	47501	33685	33925	12689	11737	13560	23649	15962	25945
1985	11395	25188	21400	13895	15051	13255	11916	10177	12477	19830	17256	14126
1986	11037	11283	17093	22120	78624	74420	18172	11918	12171	21046	15429	20861
1987	10915	12333	13394	13775	19584	22859	8017	9981	13023	19183	9192	8725
1988	7934	8511	18055	25414	13050	7747	11043	7407	11711	16122	8473	7550
1989	7421	9706	10208	12364	8925	46055	21505	13339	13553	20873	18558	11094
1990	10020	9083	11101	18902	13709	12154	11230	6881	9129	17132	9842	7927
1991	7377	6957	7278	7519	9292	28984	11552	6871	9384	18143	8505	7474
1992	7627	7054	6978	10616	28362	18442	11125	8946	13363	13079	10663	8131
1993	8286	6986	13479	50540	49206	35528	37591	26648	25703	19720	16527	23047
1994	12207	13178	15731	13068	21895	11422	12017	9278	9180	19790	20053	12038
1995	8789	7986	15156	73772	47195	76785	50442	66268	37575	16709	17435	23826
1996	14982	12341	24233	44091	74607	61108	33091	42056	14646	21456	15661	31405
1997	11576	17478	62114	78773	54259	22173	15978	11896	12641	24574	16163	29174
1998	11882	16929	18910	42356	74745	67915	45514	43047	64016	22722	19710	26181
1999	16142	26891	34972	40437	70384	59256	22973	18286	16338	21902	16015	25646
2000	11604	18249	14098	21604	71160	59618	18073	15748	11606	22418	16952	22305
2001	9344	13589	13456	16547	23962	22207	11188	9062	13206	19517	9330	9022
2002	8068	9970	28752	45669	18226	18994	15538	10829	10409	20447	19151	13549
2003	10653	9430	34675	59211	25082	22333	24536	36692	13448	24803	17172	20963
Avg.	11145	15819	24356	32947	38499	33725	23531	18970	16335	19627	15163	18027
Max	33348	64565	75310	78773	78624	77246	74605	66268	64016	24929	20053	31405
Min	6993	6957	6978	7519	8174	7747	7216	5586	8438	8665	7640	7202

Sacramento Flow at Freeport **Flow in CFS**

Difference (Cumulative minus Cumulative without Project Conditions)

Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	-76	-53	-42	-41	-41	-48	-63	-79	-80	0	0	0
1923	-20	-31	-56	-40	0	-49	-67	-79	1	5	-1	-69
1924	-129	-37	-42	-41	-39	0	-1	-1	0	77	65	-8
1925	-48	-56	-42	-41	-35	-49	-62	-77	0	-52	13	-178
1926	0	-91	-42	-42	-33	-25	-64	131	-6	-24	21	0
1927	0	-65	-47	-34	-11	-92	-64	-80	-80	1	1	1
1928	-17	-24	-45	-40	-39	-10	-61	-79	15	2	0	1
1929	-97	34	-47	-39	-40	0	-63	-35	0	77	4	0
1930	0	0	-46	-42	-43	-39	-67	-83	-56	-99	-4	-89
1931	0	0	0	-43	19	-46	0	1	0	0	1	0
1932	-12	0	-41	-38	-101	13	-62	-78	-42	-8	1	0
1933	0	0	-79	-92	-43	-51	0	-80	0	-2	4	0
1934	0	-4	-45	-38	-37	-47	0	0	0	-17	-1	0
1935	-337	-14	-59	-48	-46	-51	-60	-80	0	0	2	0
1936	0	-54	-59	-84	-709	-47	-63	-80	-81	0	0	-65
1937	-37	-54	61	-42	-41	-49	-63	-79	44	0	0	0
1938	-62	-126	-41	-262	-5	-6	-63	-79	-80	0	0	0
1939	-76	-54	0	-42	-1	-49	-62	32	-7	3	-4	-183
1940	0	0	-45	-39	-89	-11	-61	-79	0	5	1	-20
1941	-76	19	-85	-53	-5	-49	-63	-79	-80	0	0	0
1942	-34	5	-143	-39	-5	-48	-63	-79	-80	0	0	0
1943	-34	-1	-61	-276	-38	-49	-63	-80	-80	147	0	0
1944	-21	-96	-31	-41	-39	-48	-63	-79	-1	-7	0	-12
1945	0	-58	-44	-44	-39	-48	-62	-78	198	-53	10	-239
1946	-2	-22	-44	-40	-143	-312	-61	-79	150	-99	0	18
1947	0	-93	-41	-41	-41	-44	-63	6	0	0	1	-9
1948	0	-92	-38	-42	-18	-51	-60	-79	-86	0	-42	0
1949	0	-54	-42	-41	-41	-49	-63	-79	40	0	-2	28
1950	-124	-60	-92	-46	-46	-49	-60	-80	-81	51	-11	-54
1951	-34	-195	-14	-41	-42	-49	-63	-79	12	1	0	0
1952	-34	-28	-123	-39	-52	-53	-63	-79	-80	-81	-80	156
1953	-36	-118	-151	-60	-42	-49	-63	-79	-80	0	0	0
1954	-35	0	39	-116	-60	-210	-62	-80	7	0	0	6
1955	-22	-4	-44	-41	0	-50	-63	-80	25	0	-44	-79
1956	0	-103	-17	-6	-40	-49	-63	-79	-80	0	0	0
1957	-34	-26	0	-42	-44	-262	-62	-79	11	1	1	-1
1958	-125	-50	-42	-54	-8	0	-8	-79	-80	0	-80	0
1959	-77	39	-37	-112	-152	-49	-63	-79	0	4	0	5
1960	0	-22	-26	-40	-39	-261	167	-79	0	9	-5	48
1961	-17	-61	-241	-41	-49	-49	0	5	0	-1	-4	-14
1962	7	-9	-44	-39	-256	-45	-63	0	0	2	0	4
1963	-96	-127	-37	-42	-463	-47	-63	-80	-80	85	-60	-157
1964	-16	-10	-42	-41	-40	-48	-22	-79	31	0	-22	-11
1965	0	-54	-34	-5	-41	-49	-63	-79	-80	60	0	-58
1966	-33	-27	-43	-41	-41	-88	-71	-79	0	20	0	-24
1967	0	-53	-98	-40	-258	-48	-63	-80	-81	-80	-81	159
1968	-171	-70	-1	-112	-52	-48	-62	-78	25	1	0	0
1969	-78	-53	-42	-9	-5	-49	-63	-80	-80	0	0	0
1970	-77	0	-257	-5	-41	-49	-63	-79	19	3	0	44
1971	-54	-29	-129	-39	-41	-154	-62	-78	-80	0	0	-3
1972	-7	-1	-42	-40	-40	-194	-62	-79	0	19	0	-19
1973	-78	-91	-42	-64	-41	-49	-62	-79	0	8	0	44
1974	-62	-41	-191	-5	-41	-6	-63	-79	-80	0	-80	0
1975	-76	31	-42	-40	-150	-62	-62	-80	-80	0	0	0
1976	-76	2	21	-41	-3	-48	-62	1	0	-6	-1	-8
1977	29	8	9	-41	-18	62	0	0	-262	-10	164	0
1978	442	0	-39	-120	-296	-474	-62	-80	-83	3	3	3
1979	-90	39	-36	-39	-66	-48	-60	-80	82	0	0	-150
1980	0	-75	-38	-12	-5	-49	-62	-79	-80	0	0	14
1981	-80	-27	0	-40	-42	-180	-62	0	0	0	1	7
1982	0	-123	-8	-47	-5	-49	-8	-79	-80	0	0	0
1983	-252	-57	-41	-41	-5	-6	-108	-79	-80	-80	-80	0
1984	-76	-53	-5	-41	-39	-49	-63	-79	0	0	0	-78
1985	-134	-53	-42	-41	-41	-47	-64	-2	156	0	-31	-67
1986	-133	-46	-42	-40	-5	-6	-63	-79	-80	0	0	0
1987	-80	0	0	-42	-40	-48	-63	22	0	2	-94	-39
1988	0	0	-42	-39	-17	-22	-63	-79	-1	-3	-4	0
1989	0	-63	-45	-46	-40	-39	-59	0	0	2	-1	-57
1990	-60	-14	-47	-40	-41	-49	0	-79	0	38	-44	12
1991	0	0	-43	-42	17	-50	-64	-81	0	11	4	0
1992	-4	-104	-39	-43	-41	-50	-26	0	0	-127	-42	0
1993	-14	0	126	-36	-38	-207	-56	-702	-27	0	0	0
1994	-81	72	0	-39	-41	-48	1	-78	0	14	-11	-41
1995	-42	-59	-51	-13	-110	-6	-65	-81	-83	-83	-82	1
1996	-1	-18	-43	-43	-5	-50	-64	-81	-80	0	0	0
1997	-30	-26	-206	-5	-42	-50	-63	-79	20	0	0	0
1998	-36	-40	-42	-71	-8	-49	-64	-80	-81	-81	-81	-1
1999	-77	-54	-43	-42	-41	-50	-64	-80	-80	53	0	-3
2000	-35	0	0	-57	-83	-48	-64	-80	0	0	0	0
2001	-51	18	0	-43	-41	-48	-62	19	0	-19	-12	-56
2002	0	-54	-51	-41	0	-55	-61	-78	-104	51	-19	-220
2003	125	49	-556	-148	-43	-51	-66	-81	66	79	-114	-15
Avg.	-38	-35	-53	-51	-60	-64	-52	-68	-24	-1	-10	-18
Max	442	72	126	-5	19	62	167	131	198	147	164	159
Min	-337	-195	-556	-276	-709	-474	-108	-702	-262	-127	-114	-239

Appendix B

Testimony of Dr. Charles H. Hanson before the State Water Resources Control Board Water Right Applications 30358A and 30358B

ESA

EXHIBIT WDCWA-200

Testimony of Dr. Charles H. Hanson
Before the State Water Resources Control Board
Water Right Applications 30358A and 30358B

1. My name is Charles H. Hanson. I am a principal in the firm of Hanson Environmental, Inc., located at 132 Cottage Lane, Walnut Creek, California. My academic training includes Bachelor of Science and Master of Science degrees in fisheries from the University of Washington, College of Fisheries, graduate studies in environmental engineering at the Johns Hopkins University and a Ph.D. in fisheries and ecology from the University of California, Davis.

2. I have been involved in issues related to the status of fish species in the Sacramento-San Joaquin Delta since 1976. These issues have included state and federal endangered species act studies regarding fisheries populations, including the biological monitoring of listed fish species, preparation of biological assessments, preparation of habitat conservation plans and service as a member of the United States Fish and Wildlife Service's (USFWS) Sacramento-San Joaquin Delta Native Fisheries Recovery Planning Team and the National Marine Fisheries (NMFS) Service's Central Valley Salmonid Technical Recovery Team. I served as a member of the National Scientific Peer Review Panel for Stanislaus River Water Temperature Criteria for Salmonid Restoration.

3. I also served as an expert witness on fishery issues on the American River in the case of *Environmental Defense Fund v. East Bay Municipal Utility District,* Alameda County Superior Court No. 425955 and in numerous water right hearings before the State Water Resources Control Board (SWRCB). I also served as an expert witness on fishery issues in the delta smelt federal court proceeding (*NRDC et al. v. Kempthorne*) regarding the SWP and CVP OCAP biological opinion and interim remedies. I currently serve on the consultant team assisting in developing conservation strategies for water project operations and fishery habitat protection and enhancement within the Sacramento-San Joaquin Delta as part of the Bay Delta Conservation Plan (BDCP). I also served on the independent scientific peer review panel for the USBR 2008 OCAP biological assessment. A statement of my qualifications is Exhibit WDCWA-201.

4. The proposed Davis-Woodland Water Supply Project (DWWSP) will involve the construction and operation of a new diversion facility on the Sacramento River that will be shared by the DWWSP and Reclamation District 2035. The average monthly diversion rate for the DWWSP will not exceed 80.3 cfs, and diversions under the permits issued on Applications 30358A and 30358B will be operated in accordance with the SWRCB's Standard Permit Term 91. Term 91 prohibits surface water diversions when water is being released from CVP and SWP storage reservoirs to meet downstream, in-basin or Delta water right or water quality requirements. During times when Term 91 prohibits diversions under the DWWSP's water-right permits, the DWWSP may divert water pursuant to water transfers from senior upstream water right holders.

5. The DWWSP diversion structure, which will be either a flat plate screen or cylindrical screen, will be equipped with a state-of-the-art positive barrier fish screen. The fish screen will be designed to achieve a maximum approach velocity of 0.33 ft/sec in accordance with the intake design criteria established by the National Marine Fisheries Service (NMFS), California Department of Fish and Game (CDFG), and U.S. Fish and Wildlife Service (USFWS) for an intake located in an area where salmonid fry may be present but which is outside the geographic distribution of delta smelt. The intake will be located at RM 70.5 on the mainstem Sacramento River just upstream of the I-5 overcrossing in Yolo County (see Exhibit WDCWA-202). This reach of the Sacramento River serves as a migration and juvenile rearing habitat for Chinook salmon, steelhead, sturgeon, and other resident and migratory fish. The proposed intake location is upstream of the northern boundary of delta smelt distribution, which is typically identified as the I Street Bridge in downtown Sacramento, although delta smelt have occasionally been reported in low abundances at sampling stations located upstream of the I Street Bridge.

6. RD 2035 currently operates an unscreened diversion, located on the Sacramento River immediately adjacent to the proposed project. The close proximity of the two projects offers the potential opportunity to consolidate the diversions and remove an unscreened diversion from the river which would be replaced with a consolidated diversion equipped with state-of-the-art positive barrier fish screens. Juvenile winter-run, spring-run, fall-run, and late fall-run Chinook salmon, Central Valley steelhead, green sturgeon, and a variety of other fish that inhabit the Sacramento River and its tributaries are potentially vulnerable to entrainment into the existing unscreened diversion. Consolidating the existing unscreened diversion into the proposed project is dependant, in part, on the availability of funding for the proposed consolidated diversion structure. If funding is available, the consolidation of the existing unscreened diversion in combination with the proposed project offers the opportunity to reduce the risk of fish entrainment and reduce the mortality of fish inhabiting and migrating within the Sacramento River.

7. The new intake structure will be oriented parallel to the river flow along the channel margin (see Exhibit WDCWA-203). This intake configuration (referred to as “on-bank”) offers the advantage of minimizing the intake footprint and the area of aquatic habitat lost as a result of construction and long-term operation of the intake. The on-bank configuration also will reduce the effects of the intake structure on water current patterns and turbulence in the river and improves the performance of the intake screen by increasing the sweeping velocity across the screen surface. By having the intake structure parallel to the channel shoreline, the occurrence of physical structures in the river that attract predatory fish and increase the vulnerability of juvenile fish to increased predation mortality will be reduced.

8. The Sacramento River in the vicinity of the proposed intake structure serves as habitat for a variety of fish and other aquatic species. The primary fish species in the typical fish assemblage in the area are listed in Exhibit WDCWA-204. Photographs of juvenile Chinook salmon steelhead, splittail, and striped bass, some of the typical fish species that occur in the project area, are in Exhibit WDCWA-205.

9. The proposed point of diversion is located upstream of the estuarine habitats (area where freshwater and saltwater mix) within the Delta (see Exhibit WDCWA-206). The Delta is a complex network of interconnected channels and sloughs where hydrodynamic and water quality conditions are strongly influenced by tidal action for the coastal marine waters. The Delta is an important aquatic habitat that supports of 50 fish species, phytoplankton and aquatic marsh/wetland communities, zooplankton and macroinvertebrates, a wide variety of resident and migratory fish, birds, and other wildlife. Many of the species that currently inhabit the Delta were accidently or intentionally introduced (exotic or non-native species) from other areas of the world. Delta smelt and longfin smelt are two of the native pelagic species that inhabit the Delta.

10. In recent years there has been a general overall decline in the abundance of fish and other organisms within the Delta that has been referred to as the Pelagic Organism Decline (POD). A number of potential factors affecting aquatic species in the Delta have been identified. These factors include changes in hydrologic conditions and flow patterns, reductions in seasonal and annual flows through the Delta, exposure to toxics including the contributions of municipal wastewater discharges and agricultural return flows, changes in land use including levee construction, channel dredging, reclamation of tidal wetlands, predation, and non-native species. Of these factors, the DWWSP has the potential to affect river and inflows to the Delta and thereby habitat conditions for aquatic species in areas downstream of the proposed point of diversion.

11. The proposed project may, depending on hydrologic conditions in the Sacramento River, divert water during any month of the year. The average monthly diversion volumes (recognizing there is substantial variation among months and water years) that are estimated to occur under the DWWSP water-right permits under both current and future conditions, as reflected in 82 years of CALSIM hydrodynamic simulation modeling, are listed in Exhibit WDCWA-207.

12. My assessment of effects of the DWWSP on fishery resources is based on information regarding the habitat characterizations for aquatic species, the species of fish and their lifestages expected to occur in the area, the timing within the year of when various species and lifestages of fish are potentially present (see Exhibit WDCWA-208), the characteristics of the DWWSP intake (e.g., approach velocity, screen mesh size), and the seasonal distribution of DWWSP water diversions.

13. Based on these considerations, I identified and analyzed three potential mechanisms for impacts to fishery resources as part of my evaluation of the potential effects of the DWWSP. These three areas of potential fishery impacts are: (a) construction impacts related to site preparation and construction of the intake structure and the positive barrier fish screen, (b) operations of the diversion and the potential to entrain or impinge fish on the fish screen, and (c) effects of DWWSP diversions of water from the Sacramento River on habitat conditions downstream in the Sacramento River and Delta. Each of these areas is briefly discussed below.

14. Construction of the DWWSP on-bank intake structure and fish screen on the Sacramento River is expected to require the installation of a temporary sheetpile cofferdam around the work area that can then be dewatered to facilitate intake construction. In addition, local excavation and dredging may be required as part of site preparation for the intake foundation. Site disturbance may lead to increased erosion or sediment discharge into the river, and there is some risk of accidental spills of various chemicals that will be used on-site as part of the intake construction. Each of these potential impacts was evaluated in the environmental impact report (EIR) for the DWWSP. Copies of the cover page and pages 3.6-15 through 3.6-27 and 3.6-46 through 3.6-54 are included in Exhibit WDCWA-209.

15. A suite of mitigation measures has been developed for the DWWSP based on experience in constructing similar on-bank intake structures and fish screens on the Sacramento River and in Delta (e.g., RD 108 Wilkins Slough intake, RD 108 Poundstone intake, Sutter-Mutual Tisdale intake, CCWD Alternative Intake Project (AIP), and others). These mitigation measures, in the form of Best Management Practices (BMPs) are specified in the draft and final EIR for the DWWSP and in protest-dismissal agreement that the applicants signed with the CDFG (Exh. WDCWA-210), and have been incorporated into the proposed project to reduce and avoid potential adverse construction-related impacts to fish, water quality, and aquatic habitat. As a result of implementing these BMPs into the proposed project design, the potential for adverse impacts from site preparation and construction was determined to be less than significant (see Exh. WDCWA-209, pp. 3.6-46 to 3.6-52).

16. Operation of the proposed water intake has the potential to cause entrainment or impingement of fish. Entrainment occurs where small fish are drawn into an intake and pass through the fish screen. Impingement occurs when larger fish are drawn into an intake but are physically excluded from passing through the fish screen and are held against the fish screen by the hydraulic pressure created by the diversion. CDFG, NMFS, and USFWS have developed intake screen design criteria that specifically reduce and avoid these adverse effects. The DWWSP fish screen and intake will be designed and operated in accordance with these criteria (e.g., maximum allowable approach velocity, screen mesh size, screen cleaning, etc.). An intake structure and fish screen that meet these criteria are expected to be very effective (95% or greater) in avoiding adverse effects of entrainment and impingement of larger fish (greater than approximately 15 mm in length).

17. Based on the analysis of the potential environmental effects of the DWWSP, it was concluded that the fish screen will be effective in avoiding adverse effects to the juvenile and adult lifestages of fish such as Chinook salmon, steelhead, sturgeon, and all other fish inhabiting the Sacramento River. The planktonic (free floating) eggs and larvae (less than approximately 15 mm in length) will be vulnerable to being entrained through the fish screen mesh. These fish eggs and larvae could include, but are not limited to, species such as striped bass and American shad during the seasonal period in which spawning occurs by these species upstream in the river. (See Exh. WDCWA-209, pp. 3.6-15 to 3.6-27.)

18. None of the fish species that have been listed for protection under the Federal or California Endangered Species Acts will be vulnerable to entrainment at the diversions, either because of their size when they occur in the area (e.g., salmon fry and smolts, juvenile sturgeon, etc) or because of their geographic distribution further downstream in the Delta (e.g., delta and longfin smelt). The relatively low rate of diversions by the DWWSP, when compared to flow rates in the Sacramento River, especially during the spring when most fish spawn and early larval stages are present, will reduce the risk of adverse fishery impacts as a result of diversions. (See Exh. WDCWA-209, pp. 3.6-52 to 3.6-54.)

19. In addition, the on-bank intake structure will be designed to avoid and reduce potential holding areas for predatory fish and turbulence and other conditions that would increase the vulnerability of juvenile fish to increased predation risk. The on-bank intake configuration (see Exhibit WDCWA-203) also will reduce and avoid structures in the river that would serve to block or impede the upstream and downstream migration of adult and juvenile fish. Based on these factors, it was concluded that, although there is a risk of entrainment of fish eggs, larvae and smaller invertebrates, the impacts of the proposed DWWSP diversion operations on fishery resources and habitat in the Sacramento River will be less than significant. (See Exh. WDCWA-209, pp. 3.6-52 to 3.6-54.)

20. The positive barrier fish screen will undergo a performance evaluation and monitoring to document and verify that the fish screen is operating in accordance with the 0.33 ft/sec approach velocity criteria and that the velocity distribution across the screen surface is relatively uniform (see Exh. WDCWA-210, pp. 27-31, App. C). Results of this performance monitoring program will be used to fine-turn the intake screen (e.g., adjust internal baffles) to achieve suitable hydraulic screen performance. In addition, long-term procedures and protocols will be established to ensure proper inspection, repairs, and maintenance of the intake and fish screen to ensure that the facility is operating in accordance with the standard design and performance criteria.

21. The diversion of water from the Sacramento River for the DWWSP will contribute to changes in river flows and Delta inflows. The magnitude of changes in Sacramento River flows, for example at Freeport, can be used as an indicator of the potential effects of the DWWSP on fishery resources and their habitats in the lower Sacramento River and Delta. Results of CALSIM hydrologic simulation modeling over an 82 year period of hydrologic conditions were used to assess the potential effects of the proposed project operations of fishery habitat. The modeling that was conducted for the DWWSP EIR was based on the latest version of the CALSIM II model that was available at that time. For this hearing, MBK Engineers has updated that modeling work using the latest version of the CALSIM II model that currently is available. Both of these sets of modeling work compared, for each month of the 82 year period, the estimated Sacramento River flows at Freeport under existing conditions (including consideration of D-1641 and the current USFWS and NMFS biological opinions) with and without the proposed project operations as well as similar comparative analyses for anticipated future conditions. The

conclusions in the following paragraphs are based on MBK Engineers' recent modeling work.

22. Results of the comparisons show that, on average, the proposed project will change Sacramento River flows at Freeport under existing conditions by amount varying from an increase of 19 cfs (September) to a reduction of 80 cfs (October), with the majority of the changes being reductions in the range of approximately 25 to 60 cfs. Results of the analysis for anticipated future conditions were similar, with average overall flow reductions at Freeport ranging from 1 cfs (July) to 68 cfs (May), and with typical reductions in flows within the range from approximately 25 to 70 cfs. The monthly variations were substantially greater under both current and future conditions for individual months and water year types (see Exh. WDCWA-211).

23. Expressing the simulated changes in Sacramento River flows at Freeport with the proposed project as percentages of river flows without the proposed project shows the relative magnitude of average changes in instream flows that are expected. Results of these analyses are summarized in Exhibit WDCWA-212 for both current and future conditions. Results of these analyses show that the magnitude of changes in the Sacramento River flows is consistently less than 1%, with the majority of changes being within the range from -0.1% to -0.2 % under both current and future conditions.

24. Results of MBK hydrologic modeling of the estimated effects of the proposed project diversions on Delta outflow under existing conditions (see Exh. WDCWA 213) and cumulative future conditions (see Exh. WDCWA 214) show, that on average, there are small reductions (35 cfs of less) in flow within the Delta. Analysis of the estimated Delta outflows, each month, were developed using the hydrologic simulation modeling for existing and cumulative future conditions over the 82 year period of hydrologic simulation. Results of the analysis, summarized for all water years, showed that reduction in Delta outflow were 0.3% or less in all months (see Exh. WDCWA 215). The biological significance of reductions in Delta outflow within the range identified in the hydrologic simulation analyses are not expected to be detectable in terms of changes in either estuarine habitat conditions or relationships between fish species abundance indices and Delta outflow.

25. The biological responses, such as changes in habitat quality and availability, migration rates, juvenile survival, larval transport, etc., to these very small changes in river flows will be so small that they will not be detectable. Further, the relative magnitude and potential effects on fishery resources as a result of upstream diversions by the DWWSP proposed project will be diminished as flows pass further downstream and enter the Delta, where additional tributary inflows and tidal hydrodynamics will affect habitat conditions for estuarine fish and other aquatic resources. Based on results of these analyses, it was concluded that the DWWSP will result in only small incremental reductions in Sacramento River flows, and that the biological impacts on fishery resources in the Sacramento River and Delta from these changes were found to be less than significant.

26. In summary, my fishery analysis for the DWWSP project reached the following conclusions:

- Construction of the on-bank intake structure and fish screen will result in localized temporary disturbances, some risk of fish stranding during cofferdam dewatering, and some risk of exposure to increased sediments and potential accidental spills of hazardous materials. Implementation of site-specific BMPs for the DWWSP and as part of permit requirements will reduce and avoid the potential for adverse impacts to fishery resources and their habitat to less than significant levels.

- The DWWSP intake structure will be equipped with a state-of-the-art positive barrier fish screen designed and operated in accordance with CDFG, NMFS, and USFWS criteria. The fish screen is expected to be extremely effective (95% or greater effectiveness) in avoiding entrainment and impingement of fish present in the Sacramento River in the vicinity of the diversion facility. Fish eggs and larvae less than approximately 15 mm in length will be vulnerable to entrainment into the diversion. No ESA listed fish species are expected to be vulnerable to entrainment losses because of their sizes when they are in the area and their geographic distributions relative to the intake location. The fish screen will be designed to reduce and avoid structures that would attract predatory fish and the screen and intake structure will not impede or block the upstream of downstream migration of fish within the Sacramento River.

- Operation of the DWWSP diversions will slightly reduce Sacramento River flows downstream of the diversion. The flow reductions, as estimated at Freeport, will be small (average reductions of 0.1% to 0.2 % in most months) and are not expected to result in any adverse biological impacts like reduced juvenile Chinook salmon migration rates or survival that would be large enough to be detectable. Operation of the DWWSP diversions will also slightly reduce Delta outflows. The Delta outflow reductions will be small (average reductions of 0.1% to 0.3 % in most months) and are not expected to result in any adverse biological impacts like reduced juvenile Chinook salmon migration rates or survival that would be large enough to be detectable. The relative influence of the DWWSP diversions on flows further downstream in the Delta will be progressively less. The magnitude of the expected changes in river flows and Delta outflows and associated fishery habitat quality and availability will be less than significant.

Exhibit WDCWA-212. Average monthly percentage change in Sacramento River flows at Freeport with and without the proposed project.

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Current Conditions	-0.7	-0.1	-0.2	-0.2	-0.1	-0.2	-0.2	-0.4	-0.1	0.0	-0.1	0.1
Future Conditions	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.4	-0.1	0.0	-0.1	-0.1

Exhibit WDCWA-215. Average monthly percentage change in Delta outflow with and without the proposed project.

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Current Conditions	-0.2	-0.1	-0.1	-0.2	-0.1	-0.2	-0.2	-0.3	-0.2	0.0	-0.3	0.1
Future Conditions	-0.1	-0.1	-0.3	-0.2	-0.1	-0.2	-0.2	-0.3	-0.2	0.0	-0.2	0.0

Appendix C

Summary Comparison of Facility Siting and Water Transfer Option Impacts for the DWWSP

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TABLE ES-3
SUMMARY COMPARISON OF FACILITY SITING AND WATER TRANSFER OPTION IMPACTS FOR THE DWWSP

	Diversion/Intake Option			WTP Site Option		Water Transfer Seller Options					
Environmental Topic	Option 1	Option 2	Option 3	Davis Site	Woodland Site	ACID	Browns Valley Irrigation District	Reclamation District 108	River Garden Farms	**Conaway Preservation Group**	Natomas Central Mutual Water Company
Surface Water & Water Quality											
Impact 3.2-1. The Project would violate water quality standards or waste discharge requirements.	NI	NI	NI	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.2-2. Project operation would adversely affect Sacramento River hydrologic conditions or Delta inflow and/or outflow in a way that would conflict with other water management objectives or existing beneficial uses.	LS	LS	LS	LS	LS	LS	LS	LS	LS	**LS**	LS
Impact 3.2-3. Project operation would substantially degrade water quality of the Sacramento River or Delta.	LS	LS	LS	LS	LS	LS	LS	LS	LS	**LS**	LS
Impact 3.2-4. Project operation would infringe upon the water rights of other legal users of water.	NI	NI	NI	NI	NI	NI	NI	NI	NI	**NI**	NI
Groundwater											
Impact 3.3-1. The Project could violate any water quality standards or waste discharge requirements, or otherwise substantially degrade groundwater quality.	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	**LSM**	LSM
Impact 3.3-2. The Project could 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.	LS	LS	LS	LS	LS	LSM	NI	LSM	LSM	**LSM**	LSM
Impact 3.3-3. Groundwater pumping associated with Project operation could alter the existing surface hydrology and water quality.	NI	NI	NI	NI	NI	LSM	NI	LSM	LSM	**LSM**	LSM
Land Use and Agriculture											
Impact 3.5.2: The Project would conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect.	NI	NI	NI	LSM	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.5.3: The Project would conflict with existing zoning for agricultural use, or a Williamson Act contract in an area in which continued agriculture is economically viable.	NI	NI	NI	SU	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.5.4: Construction of the Project would involve other changes in the existing environment that, due to its location or nature, would result in conversion of farmland, to non-agricultural uses.	LSM	SU	SU	SU	NI	NI	NI	NI	NI	**NI**	NI
Fisheries Resources											

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	Diversion/Intake Option			WTP Site Option		Water Transfer Seller Options					
Environmental Topic	Option 1	Option 2	Option 3	Davis Site	Woodland Site	ACID	Browns Valley Irrigation District	Reclamation District 108	River Garden Farms	**Conaway Preservation Group**	Natomas Central Mutual Water Company
Impact 3.6-1. The Project would interfere substantially with the movement of any native resident or wildlife species or with established native resident or migratory native wildlife corridors, or impede the use of wildlife nursery sites.	LSM	LSM	LSM	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.6-2. The Project would conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	LSM	LSM	LSM	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.6-3. The Project would conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.	NI	NI	NI	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.6-4. Construction of the intake would have a substantial adverse effect on fish or other aquatic species, such as by increasing turbidity, degrading water quality or otherwise altering suitable aquatic habitat.	LSM	LSM	LSM	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.6-5. Construction of the Project intake structure would generate noise or vibrations that would adversely affect the behavior, movement, and local distribution of special-status fish.	LS	LS	LS	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.6.6. Operation of the intake facility would cause entrainment and/or impingement mortality of special-status fish or other aquatic species.	LS	LS	LS	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.6-7. The Project would have other substantial adverse effects, 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 CDFG, USFWS, or NMFS.	LSM	LSM	LSM	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.6-8. The Project would have other substantial adverse affects on riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the CDFG or USFWS.	LSM	LSM	LSM	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.6-9. The Project would have other substantial adverse effects on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.	LSM	LSM	LSM	NI	NI	NI	NI	NI	NI	**NI**	NI
Geology, Soils, and Seismicity											

TABLE ES-3
SUMMARY COMPARISON OF FACILITY SITING AND WATER TRANSFER OPTION IMPACTS FOR THE DWWSP

Environmental Topic	Diversion/Intake Option			WTP Site Option		Water Transfer Seller Options					
	Option 1	Option 2	Option 3	Davis Site	Woodland Site	ACID	Browns Valley Irrigation District	Reclamation District 108	River Garden Farms	**Conaway Preservation Group**	Natomas Central Mutual Water Company
Impact 3.7-1: The Project could expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground shaking; seismic-related ground failure, including liquefaction; and landslides.	LSM	LSM	LSM	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.7-2: The Project could result in substantial soil erosion or the loss of topsoil.	LSM	LSM	LSM	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.7-3: The Project could 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 offsite landslide, lateral spreading, subsidence, liquefaction or collapse.	LS	LS	LS	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.7-4: The Project could be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code, creating substantial risks to life or property.	LS	LS	LS	NI	NI	NI	NI	NI	NI	**NI**	NI
Air Quality											
Impact 3.8.1: Project construction and/or operation would violate any air quality standard or contribute substantially to an existing or projected air quality violation.	SU / LS*	SU / LS*	SU / LS*	SU / LS*	SU / LS*	NI	NI	NI	NI	**NI**	NI
Impact 3.8.2: The Project would conflict with or obstruct implementation of the applicable air quality plan.	SU / LS*	SU / LS*	SU / LS*	SU / LS*	SU / LS*	NI	NI	NI	NI	**NI**	NI
Impact 3.8.3: Project construction and/or operation would expose sensitive receptors to substantial pollutant concentrations.	SU / LS*	SU / LS*	SU / LS*	SU / LS*	SU / LS*	NI	NI	NI	NI	**NI**	NI
Noise											
Impact 3.9-1: Proposed Project construction and/or operation would expose persons to or generate noise levels in excess of applicable standards from local general plans or noise ordinances, or applicable standards of other agencies.	SU/ LSM	SU/ LSM	SU/ LSM	NI	NI	NI	NI	NI	NI	**NI**	NI

TABLE ES-3
SUMMARY COMPARISON OF FACILITY SITING AND WATER TRANSFER OPTION IMPACTS FOR THE DWWSP

	Diversion/Intake Option			WTP Site Option		Water Transfer Seller Options					
Environmental Topic	Option 1	Option 2	Option 3	Davis Site	Woodland Site	ACID	Browns Valley Irrigation District	Reclamation District 108	River Garden Farms	**Conaway Preservation Group**	Natomas Central Mutual Water Company
Impact 3.9-2: Proposed Project construction would expose persons to or generate excessive ground-borne vibration or ground-borne noise levels.	LS	LS	LS	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.9.4: The Project would cause a substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project.	SU	SU	SU	NI	NI	NI	NI	NI	NI	**NI**	NI
Hazards and Hazardous Materials											
Impact 3.10-1: The Project could create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, or through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.	LSM	LSM	LSM	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.10-2: The Project could emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.	LSM	LSM	LSM	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.10-3: The Project could be located on a site that is included on a list of hazardous materials sites and, as a result, would create a significant hazard to the public or the environment.	LSM	LSM	LSM	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.10-4: The Project could be located within two miles of an airport and result in a safety hazard for people residing or working in the project area	LS	LS	LS	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.10-5: The Project could impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	LSM	LSM	LSM	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.10-6: The Project could 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.	LSM	LSM	LSM	NI	NI	NI	NI	NI	NI	**NI**	NI
Public Health											
Impact 3.11-1: The Project would create a significant public health risk through the introduction of contaminants to the drinking water supply at concentrations with known adverse effect.	NI	NI	NI	NI	NI	NI	NI	NI	NI	**NI**	NI
Transportation											

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Environmental Topic	Diversion/Intake Option			WTP Site Option		Water Transfer Seller Options					
	Option 1	Option 2	Option 3	Davis Site	Woodland Site	ACID	Browns Valley Irrigation District	Reclamation District 108	River Garden Farms	**Conaway Preservation Group**	Natomas Central Mutual Water Company
Impact 3.12-1: Project construction would substantially increase traffic in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections).	LSM	LSM	LSM	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.12-2: The Project would exceed, either individually or cumulatively, a level of service standard established by the local County Congestion Management Agency for designated roads or highways.	LS	LS	LS	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.12-3: The Project would 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.	NI	NI	NI	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.12-4: Project construction would increase potential traffic safety hazards for vehicles, bicyclists, and pedestrians on public roadways.	LSM	LSM	LSM	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.12-5: Construction would adversely affect access to adjacent land uses and temporarily block access routes used by city police departments, Yolo County Sheriff's Department, fire departments, and emergency services.	LSM	LSM	LSM	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.12-6: Construction of the Project would displace existing on-street parking and result in inadequate parking capacity.	LSM	LSM	LSM	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.12-7: The Project would conflict with adopted policies, plans, or programs supporting alternative transportation.	LS	LS	LS	NI	NI	NI	NI	NI	NI	**NI**	NI
Public Services and Utilities											
Impact 3.13-1: The Project would generate the need for new or physically altered governmental facilities in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services.	LS	LS	LS	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.13-2: The Project would 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.	SU	SU	SU	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.13-3: The Project would require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.	NI	NI	NI	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.13-4: The Project would be served by a landfill without sufficient permitted capacity to accommodate the project's solid waste disposal needs.	LS	LS	LS	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.13-5: The Project would violate federal, state, and local statutes and regulations related to solid waste.	LS	LS	LS	NI	NI	NI	NI	NI	NI	**NI**	NI

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Impact 3.13-6: Construction of the Project would result in conflict with other existing utilities, causing interference with their operation or function.	LSM	LSM	LSM	NI	NI	NI	NI	NI	NI	**NI**	NI
Cultural Resources											
Impact 3.14-1: Project construction would cause a substantial adverse change in the significance of a historical or unique archaeological resource within the Project area.	LSM	LSM	LSM	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.14-2: Project construction would directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	LSM	LSM	LSM	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.14-3: Project construction would disturb any human remains, including those interred outside of formal cemeteries.	LSM	LSM	LSM	NI	NI	NI	NI	NI	NI	**NI**	NI
Recreational Resources											
Impact 3.15-1: The Project could increase the use of existing neighborhood or regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.	NI	NI	NI	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.15-2: The Project could include recreational facilities or require the construction or expansion of recreational facilities which might have a significant adverse physical effect on the environment.	NI	NI	NI	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.15-3: Construction and operation of the intake could reduce access to, or interfere with the use of existing recreational opportunities or facilities, including recreational use of the Sacramento River.	LSM	LSM	LSM	NI	NI	NI	NI	NI	NI	**NI**	NI
Aesthetic Resources											
Impact 3.16-3: The Project could substantially degrade the existing visual character and quality of the site and its surroundings.	SU	SU	SU	NI	NI	NI	NI	NI	NI	**NI**	NI
Impact 3.16-4: The Project would create a new source of substantial light or glare that would adversely affect nighttime views in the area.	SU	SU	SU	NI	NI	NI	NI	NI	NI	**NI**	NI