RECLAMATION
Managing Water in the West

Environmental Assessment (EA)

Five-Year Temporary Warren Act Contract between the United States and the El Dorado Irrigation District

Central California Area Office Folsom, CA

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U.S. Department of the Interior
Bureau of Reclamation
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Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

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

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List of Acronyms and Abbreviations

AF	Acre-Feet
AFRP	Anadromous Fish Restoration Program
AFY	Acre-Feet Per Year
BA	Biological Assessment
BO	Biological Opinion
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
Cfs	cubic feet per second
Contract	Five-Year Temporary Warren Act Contract
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CWP	Cold Water Pool
Delta	Sacramento–San Joaquin River Delta
DPS	Distinct Population Segment
DWR	Department of Water Resources
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESA	Endangered Species Act
ESU	Environmentally Significant Unit
FERC	Federal Energy Regulatory Commission
FESA	Federal Endangered Species Act
FLRWPS	Folsom Lake Raw Water Pump Station
FONSI	Finding of No Significant Impact
ITA	Indian Trust Assets
LTWA	Long-Term Warren Act
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
M&I	Municipal and Industrial
msl	mean sea level
MW	megawatts
MWH	megawatt hours
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
Non-Project	Not Part of the Central Valley Project
OCAP	Operations Criteria and Plan
PG&E	Pacific Gas and Electric Company
Project 184	El Dorado Hydroelectric Project No. 184
RPAs	Reasonable and Prudent Alternatives
Reclamation	Bureau of Reclamation
RM	river mile
SWP	State Water Project
SWRCB	State Water Resources Control Board
TCD	Temperature Control Device
USFWS	U.S. Fish and Wildlife Service

USGS	U.S. Geological Survey
WA	Warren Act
WAPA	Western Area Power Administration
WUA	weighted usable area

Section 1 Introduction

In accordance with the National Environmental Policy Act of 1969 (NEPA), as amended, the Bureau of Reclamation (Reclamation) has prepared this Environmental Assessment (EA) to evaluate and disclose any potential environmental impacts associated with the implementation of a five-year Temporary Warren Act contract (Contract) with the El Dorado Irrigation District (EID). This proposed Contract between Reclamation and EID would be for the conveyance of up to 8,500 acre-feet per year (AFY) of non-Project water from EIDs El Dorado hydroelectric power generation project (Project 184) facilities into the Central Valley Project (CVP) facilities at Folsom Reservoir for diversion at EIDs Folsom Lake Raw Water Pump Station (FLRWPS), which is located on the south shore of Folsom Reservoir in El Dorado Hills.

1.1 Background

EID was formed in 1925, and it exists and operates under the Irrigation District Act (Cal. Water Code §§ 20500 et seq.). EID provides water, recycled water, and wastewater treatment services within approximately 220 square miles of central and western El Dorado County. EID provides water service to an extensive area generally bordered by Sacramento County to the west, the South Fork American River to the north, the El Dorado National Forest to the east, and the North Fork of the Cosumnes River to the south. The EID service area also includes a small area in Sacramento County, a portion of Coloma and Swansboro north of the South Fork American River, Project 184 lands, and the communities of Outingdale and Strawberry. Existing EID water supplies and sources needed to meet projected water demands, as well as efforts underway to meet those demands, are discussed below.

El Dorado County, like other mountain counties in general, has limited water supply options. Publicly developed surface water is the predominant water source for the western slope of El Dorado County. Groundwater on the western slope and in the Sierra Nevada is limited by the fractured rock nature of the sub-surface geology; consequently, to date no opportunities for groundwater storage or conjunctive use projects within El Dorado County have been identified. Population growth in the mountain counties region exceeds the statewide average because of the movement of people to the foothills area. In El Dorado County, this is particularly evident in the western portion of EIDs service area. In addition, there has been an increased interest in agricultural development on the western slope of the Sierra Nevada foothills, with viticulture predominating recent agricultural development.

Reclamation completed a Water Needs Assessments for the CVP American River Division contractors, including EID, as part of the long-term contract renewal

process (Reclamation, 2005). The needs assessment methodology confirmed that there is a demonstrated need for additional water supplies to serve EIDs federal service area. To address the El Dorado County 2004 General Plan and EID future demand forecasts, EID is engaged in an array of initiatives associated with firming up existing water supplies and acquiring new water supplies as part of its long-term efforts at meeting projected future demands. EID has conducted extensive evaluations of its water supply options, and continues to refine and further evaluate alternatives as additional information becomes available. However, even with implementation of water conservation measures, there is still a need to secure additional water supplies to address projected future demands within the service area.

On October 2, 1996, the State Water Resources Control Board (SWRCB) adopted Decision 1635 (D-1635), which authorized EID the rediversion of stored Project 184 water for consumptive use purposes, and direct diversion of a total of 17,000 AFY at Folsom Reservoir.

On April 2, 1999, the Federal Energy Regulatory Commission (FERC) approved the transfer to EID of the federal license to operate Project 184, following the purchase of Project 184 from the Pacific Gas and Electric Company (PG&E). On September 16, 1999, the California Public Utilities Commission approved the transfer to EID of project facilities and related assets, including water rights. EID assumed ownership on October 15, 1999.

On August 16, 2001, the SWRCB issued Order WR 2001-22, which took final action on petitions for reconsideration of D-1635, and affirmed the decision as modified. This order upheld D-1635's grant of 17,000 AFY of consumptive use water rights to EID. On October 16, 2001, the SWRCB adopted Water Rights Permit 21112, in conformance with Order WR 2001-22, by which EID secured this water right. Water Rights Permit 21112 allows EID to divert and use Project 184 water for consumptive use purposes as it relates to the Proposed Action. EID currently operates Project 184 in the amount of 17,000 AFY for power generation purposes, and to satisfy release requirements and monthly lake level targets contained within the FERC license.

To facilitate the diversion of Project 184 water from Folsom Reservoir through EIDs FLRWPS, Reclamation proposes to enter into a Warren Act (WA) contract with EID for the diversion of 8,500 AFY to be conveyed through Folsom Reservoir. Although EID is authorized to divert up to 17,000 AFY of Project 184 water for consumptive use purposes under Water Rights Permit 21112, EID must limit diversions to 8,500 AFY until cold water pool (CWP) management of Folsom Reservoir is improved. Prior to EID diverting the remaining 8,500 AFY, EID must implement a temperature control device (TCD) on its FLRWPS intake, or contribute toward structural improvements (e.g., a TCD or other mechanism) in order to improve temperature management in Folsom Reservoir. Because specific temperature control measures have not yet been identified, EID will limit

diversions of Project 184 water until a temperature control measure has been implemented. Any action pertaining to the diversion of the remaining 8,500 AFY of Project 184 water will undergo subsequent NEPA and ESA compliance documentation.

The WA (43 U.S.C. §523) of 1911 provides authorization to the Secretary of the Interior to enter into WA contracts with water purveyors to carry non-CVP water (i.e., water not part of the CVP) through federal facilities. These contracts provide for the impounding, storage, and conveyance of non-CVP water for domestic, municipal, fish and wildlife, industrial, and other beneficial uses using any CVP facilities identified in the law, including Folsom Reservoir.

1.2 Purpose and Need

The purpose of executing the proposed WA contract is to allow EID to convey up to 8,500 AFY of non-Project water through Folsom Reservoir for withdrawal, treatment, and use within the western portion of EIDs service area (Figure 1-1). Long-term water supplies necessary to meet EIDs buildout water needs have been identified in several planning documents, including: (1) EIDs *Water Supply Master Plan* (EID, 2001); (2) *El Dorado County General Plan* (EDC, 2004); (3) EID's *2007 Water Resources and Service Reliability Report* (EID, 2007); and (4) El Dorado County Water Agency's (EDCWA) 2008 *Water Resources Development and Management Plan* (WRDMP). The WA contract between Reclamation and EID is needed to: (1) help meet the existing need for additional water supplies in EIDs service area; and (2) support EID's ongoing water supply planning and conservation activities.

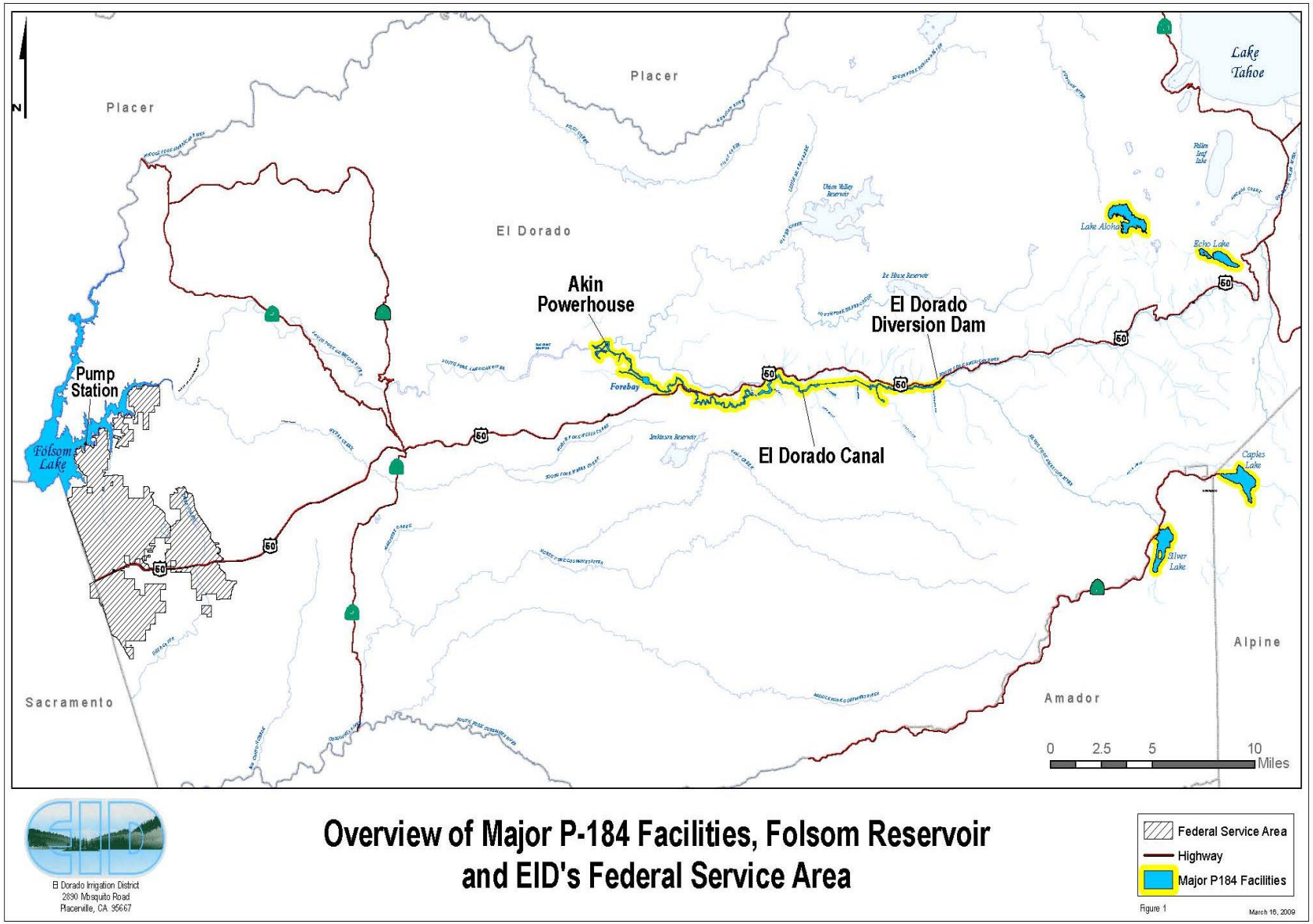

Figure 1-1 Overview of Major Project 184 Major Facilities, Folsom Reservoir and EID's Federal Service Area

Section 2 Alternatives Including the Proposed Action

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

2.1 No Action Alternative

Under the No Action Alternative, Reclamation would not enter into a five-year WA contract with EID. Therefore, EID would not be able to divert up to 8,500 AFY of their Project 184 water. As a result, there would be no change to flows in the lower American River. The water identified in the Proposed Action would continue to enter the lower American River. EID would not be able to divert the water from Folsom Reservoir, hindering EIDs mission and fiduciary obligations as a water purveyor and contrary to the grant of water rights in Permit 21112. As a result, this water would not be available for M&I uses within the western portion of EIDs service area. Furthermore, there would be no change in Folsom Reservoir water storage/elevation or available cold water volume.

2.2 Proposed Action

The U.S. Bureau of Reclamation (Reclamation) proposes to enter into a Temporary five-year WA contract with EID to convey up to 8,500 AFY of non-Project water (i.e., water not part of the Central Valley Project [CVP]) through Folsom Reservoir for municipal and industrial (M&I) uses in the western portion of El Dorado County.

The proposed quantity will come from the outflow of non-project water from bypassed flows at the Kyburz diversion dam and releases from the El Dorado Powerhouse. The water rights for the non-project water include EIDs direct diversion rights for waters of the South Fork American River at the Kyburz diversion dam, and rights for diversion to storage at Caples Lake in Alpine County, Silver Lake in Amador County, and Lake Aloha in El Dorado County, California. The sources of non-project water will be made available by the operation of existing facilities of the FERC Project No. 184 (SWRCB Permit 21112). Direct diversion water rights from the South Fork American River are available from November 1 through July 31. Direct diversions are not available August 1 through October 31 pursuant to the conditions of SWRCB Permit 21112; therefore, water diverted to storage will be released from Caples Lake, Silver Lake, and Lake Aloha for downstream uses. EID utilizes gages to measure the volume of water introduced to and diverted from Folsom Reservoir to ensure compliance with minimum streamflows as required by the SWRCB Permit 21112.

2.2.1 Project Operations

Water Sources

The sources of non-Project water include flows from the South Fork American River at the Kyburz diversion dam and releases of water diverted to storage in Caples Lake, Silver Lake, and Lake Aloha as granted in Water Rights Permit 21112 by the SWRCB. Although Echo Lake is a major facility of Project 184, it is not included as a source in either Permit 21112 or the proposed contract. The water rights included in Permit 21112 are made available by the operation of existing facilities of FERC Project 184. The total quantity of water to be taken under the Proposed Action at Folsom Reservoir by diversion and rediversion is limited to 8,500 AFY.

Project 184 Operation

Project 184 is located on the South Fork of the American River and its tributaries in El Dorado, Alpine, and Amador Counties, California, and occupies EID lands, private lands, and federally owned lands administered by the El Dorado National Forest and the Lake Tahoe Basin Management Unit (Figure 1-1).Water is stored in four upstream reservoirs and released into the South Fork American River, either directly, via its tributaries, or via a conduit. Stored releases and natural flows are diverted into the 22.3-mile El Dorado Canal via the El Dorado Diversion Dam located on the South Fork American River downstream of the mouth of the Silver Fork American River. Flows in the canal are augmented seasonally by the diversion of various minor tributaries of the South Fork American River (including Alder Creek, Mill Creek, Bull Creek, Ogilby Creek, Esmeralda Creek, and No Name Creek).

Project 184 will continue to operate for consumptive use water supply and power generation purposes pursuant to all regulatory requirements. Under the Proposed Action EID does not propose any changes to the schedule or volume of water delivered to Folsom Reservoir (i.e., operation of Project No. 184 continue to operate pursuant to release requirements and monthly lake level targets contained with the FERC license). EID will also operate Project 184 for power generation, and will sell the power to offset the cost of operating maintaining the water supply function of Project 184

Water Measurement Reporting

The Proposed Action includes measurement (i.e. stream gages) and monthly reporting at eleven locations to measure volumes of water introduced and diverted from Folsom Reservoir. These gages are intended to track diversions, ensure compliance with minimum instream flow requirements, and demonstrate actual volumes of water introduced in Folsom Reservoir, including conveyance losses. The gaging station locations are located at the South Fork of the American River below Kyburz (El Dorado) Diversion Dam, El Dorado Powerhouse, Caples Creek (Caples Lake outlet), Silver Fork American River (Silver Lake outlet and leakage – two gages), Pyramid Creek (Lake Aloha outlet), Echo Conduit (Echo Lake

outlet to South Fork American River, El Dorado Canal at Kyburz, El Dorado Forebay Outlet to EID's Main Ditch, Hazel Tunnel to Jenkinson Lake, and Folsom Lake Raw Water Pump Station.

Under the Proposed Action, EID will submit an annual schedule to Reclamation with forecasted diversion quantities for the water year. Each month, EID will provide a report to Reclamation that documents the following information for the previous month and updated forecasts for future months.

2.2.2 Action Area

The Action Area consists of Folsom Reservoir downstream to the lower American River at the confluence of the Sacramento River (Figure 2-1), and the EID long-term WA contract service area (Figure 1-1). This Action Area was selected for the following reasons: (1) the total volume to be diverted (up to 8,500 AF) is small relative to Folsom Reservoir's capacity (977,000 AF) and the combined flows of the lower American and Sacramento rivers; (2) the water to be diverted under the Proposed Action is real water from existing water supplies that is measured upon entering Folsom Reservoir as well as the Folsom Lake Raw Water Pump Station; and (3) potential changes to the CWP volume in Folsom Reservoir provide a reasonable metric for evaluating potential effects to anadromous fishes downstream in the lower American River.

Figure 2-1 Folsom Reservoir and the Lower American River

Section 3 Affected Environment and Environmental Consequences

This EA does not analyze resources for which it would be reasonable to assume that no impacts would occur from the implementation of the Proposed Action. Specifically, potential impacts to , soils, geology, mineral resources, land use, visual resources, transportation, noise, hazards and hazardous materials, public services, utilities, and service systems. A five-year temporary Warren Act contract would not result in impacts to these resources or services. In addition to the resources stated above, Reclamation considered and determined that the Proposed Action would not impact the following resources:

Indian Trust Assets (ITA)

Indian Trust Assets (ITSs) are legal interests in property or rights held in trust by the United States for Indian Tribes or individual Indians. Indian reservations, Rancherias, and Public Domain Allotments are common ITAs in California. The Proposed Action does not have a potential to affect Indian Trust Assets (See Appendix C, Indian Trust Assets Compliance Memo).

Indian Sacred Sites

Since no modification of the existing federal facilities is necessary and use of these facilities will remain within capacity, no Indian sacred sites will be infringed. The Proposed Action will not result in any ground disturbance and therefore would have no effect on Indian sacred sites.

Environmental Justice

Environmental Justice conditions in the American River Division counties under the Proposed Action would be identical to conditions under the No Action Alternative.

Cultural Resources

By implementing the Proposed Action Alternative, all water will be delivered within existing water service area boundaries utilizing existing water conveyance. The Proposed Action has no potential to cause effects to cultural resources eligible for inclusion in the National Register of Historic Properties pursuant to 36 CFR §800.3(a)(1) (See Appendix B, Cultural Resources Compliance Memo).

Air Quality

Since the Proposed Action uses electrical power to convey water, there is no potential to cause direct or indirect emissions of criteria pollutants that equal or exceed *de minimis* thresholds, a conformity analysis is not required pursuant to the Clean Air Act.

Recreation

With implementation of the Proposed Action, Folsom Reservoir storage would decrease less than 0.4 percent in July through September; the remainder of the year would exhibit less of a change. This change in reservoir storage would not lead to a measureable change in the water elevation in the reservoir; therefore, there will be no recreational effects on the lower American River, Lake Natoma or Folsom Reservoir with implementation of the Proposed Action.

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

3.1 Water Supply and Hydrology

The analysis of potential effects on water resources associated with the Proposed Action was based on whether a reduction in Folsom Reservoir storage or lower American River flows below Nimbus Dam would be of sufficient magnitude to affect the water supply availability to CVP contractors. This analysis was based on the conveyance and withdrawal of EIDs entire 17,000 AFY of Project 184 water, and therefore it is reasonable to assume that the potential effects on water resources under the Proposed Action of the conveyance and withdrawal of 8,500 AFY would be less than those analyzed for the entire 17,000 AFY.

3.1.1 Affected Environment

Folsom Dam and Reservoir

Folsom Reservoir, a federal facility, will be used to convey water under the proposed WA contract. Federal facilities at Folsom Dam will not be used to deliver water under this WA contract. EID operates its own facility, the FLRWPS, which is located on the south shore of Folsom Reservoir in El Dorado Hills.

Folsom Reservoir is the principal reservoir on the American River, with a maximum storage capacity of 977,000 AF. Reclamation operates Folsom Dam and Reservoir for multiple authorized purposes including: to regulate rivers; improve flood control and navigation; to provide water for irrigation and domestic use; to generate power; and under later reauthorizations and legislation, additional project purposes were added including recreation, fish and wildlife enhancement, and water quality improvements.

Lake Natoma and Nimbus Dam

Lake Natoma, formed as a result of Nimbus Dam, serves as the Folsom Dam afterbay. Lake Natoma has a maximum storage capacity of 9,000 AF, and at its full capacity, consists of approximately 500 surface-acres of water. Lake Natoma is operated as a re-regulating reservoir that accommodates the diurnal flow fluctuations caused by the power peaking operations at Folsom Power Plant. Nimbus Dam, along with Folsom Dam, regulates water releases to the lower

American River. In addition to its role as a regulating facility for Folsom Dam releases, Nimbus Dam is the diversion location for the Folsom South Canal.

Lower American River

The lower American River consists of the 23-mile stretch of river from Nimbus Dam to the confluence of the American and Sacramento rivers in the City of Sacramento. Average lower American River annual flows downstream of Folsom Dam at Fair Oaks are approximately 2,650,000 AF (Reclamation, 2004).

EID's Long-Term Warren Act Contract Service Area

EID was formed in October 1925 to provide public water service to the city of Placerville as well as other residential, commercial, and industrial customers, and to provide irrigation water to local agricultural customers. Currently EID serves a population of approximately 100,000 people. The current service area of EID encompasses approximately 220 square miles and is generally bounded by Sacramento County to the west, the South Fork American River to the north, the El Dorado National Forest to the east, and the North Fork Cosumnes River and Latrobe to the south. The elevation across the service area ranges from approximately 500 feet in the west to approximately 4,000 feet in the east.

The area affected by the Proposed Action is illustrated in Figure 1-1. This area encompasses the community of El Dorado Hills and a portion of Cameron Park, and is generally bounded on the north by Folsom Reservoir, on the east by an elevation equal to Cameron Park Drive, on the south by Deer Creek and an El Dorado Joint Union High School District school site, and on the west by the El Dorado County/Sacramento County line, except for a small portion of the service area that extends into Sacramento County. Implementation of the Proposed Action would not require any physical changes to EIDs El Dorado Hills Water Treatment Plant or FLRWPS.

3.1.2 Environmental Consequences

No Action

Implementation of the No Action Alternative would not change current water supply and hydrology conditions in Folsom Reservoir and the lower American River. The Proposed Action, 8,500 AFY diversions from the South Fork American River, would continue to flow into Folsom Reservoir and then into the lower American River as presently occurs.

Proposed Action

Potential impacts to Folsom Reservoir and the lower American River, resulting from implementation of the Proposed Action were identified and evaluated relative to the No Action Alternative. The analysis of potential effects was based on identifying reductions in Folsom Reservoir storage or river flows below Nimbus Dam. Studies showing potential impacts resulting from the implementation of the Proposed Action were modeled for the entire 17,000 AF of Project 184 water; therefore, it is reasonable to assume that potential impacts

under the Proposed Action for the diversion of 8,500 AFY would be less than those identified in the studies.

In the prior CALSIM II study for 17,000 AF, modeling showed that implementation of the Proposed Action would have a small effect, both positive and negative, on storage in Folsom Reservoir (Table A-1); these data include wet, above normal, below normal, dry, and critical years. Monthly Folsom Reservoir storage resulting from the Proposed Action can vary upwards and downwards from the No Action Alternative. Typically, a difference greater than ± 5,000 AF in one month is offset by corresponding difference in the following month(s) in the opposite direction. This compensating behavior is indicative of the model logic maintaining a balance between monthly operations.

By water year's end (September 30), the maximum effect of the Proposed Action for all years is shown to be less than 2,000 AF. This quantity (less than 0.4 percent reduction in storage) would most likely not be identifiable in actual operations; and therefore, would not be observable in the reservoir temperature. As a result, there would be no impacts on Folsom Reservoir storage with the implementation of the Proposed Action.

CALSIM II studies show that implementation of the 17,000 AF Warren Act would have a small effect, both positive and negative, on monthly average flows in the lower American River (Table A-2); these data include wet, above normal, below normal, dry, and critical years. The monthly average lower American River flows below Nimbus Dam resulting from the Proposed Action can vary upwards and downwards from the No Action Alternative.

Typically, these changes are small in comparison to the magnitude of flows. Monthly average flow differences are usually ±3 percent of the No Action Alternative, which in real-time operations is about the limit of measurement capability. Differences greater than ±3 percent are usually offset by changes in a subsequent month(s). These changes would most likely not be identifiable in actual operations.

Existing minimum instream flow policies would remain in effect. As a result, there would be a negligible impact on flows in the lower American River with the implementation of the Proposed Action.

3.2 Hydropower

Hydroelectric facilities generate a significant portion of California's energy requirements. Water agencies and private electric utilities own and operate in-stream reservoirs that store and release water to generate hydroelectric power. Electric utilities produce power for their customers, while water agencies produce power for their own use and market the excess to electric utilities, government and public installations, and commercial customers.

CVP power is the source of electricity for CVP pumping facilities throughout the Central Valley, and for many of California's communities. The Western Area Power Administration (WAPA) sells excess CVP capacity and energy (supplementary to CVP internal needs) to municipal utilities, irrigation districts, and institutions and facilities such as wildlife refuges, schools, prisons, and military bases. The CVP sells power at rates designed to recover costs. For the CVP, these rates historically have been slightly below market rates. Revenue from WAPA power sales is an important funding source for the CVP Restoration Fund and for repaying project debt incurred during construction of the CVP.

The hydroelectric generation facilities of the CVP are operated by Reclamation. Reclamation manages and releases water in accordance with the various acts authorizing specific projects and in accordance with other laws and enabling legislation. Hydropower operations at each facility must comply with minimum and maximum flows and other constraints set by Reclamation, the United States Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), or other regulatory agencies, acting in accordance with law or policy.

3.2.1 Affected Environment

Folsom Power Plant

The Folsom Power Plant is at the foot of Folsom Dam on the north side of the American River. The Folsom Power Plant has three generating units, with a combined capacity of 215 megawatts (MW) (Reclamation, 2001), and a total release capacity of approximately 8,600 cfs. By design, the facility is operated as a peaking facility. Peaking plants schedule the daily water release volume during the peak energy demand hours to maximize generation at the time of greatest need. During other hours of the day, the plant may release little or no water, generating little or no power. The Folsom Power Plant generates an average annual 620,000 megawatt hours (MWh). Both the power and power plant releases mentioned above are maxima that are based on a maximum reservoir elevation of 465 feet.

Folsom Dam is primarily a flood control facility and during a flood event it would be operated to minimize downstream flooding. Folsom Dam also has the ability to release (bypassing power generation) about 28,600 cfs through the River Outlet Works.

Nimbus Power Plant

The Nimbus Power Plant is on the right abutment of Nimbus Dam (Lake Natoma) on the north side of the American River. To avoid fluctuations in flows in the lower American River, Nimbus Dam and Lake Natoma serve as a regulating facility. While the water surface elevation fluctuates, releases to the lower American River remain constant. The Nimbus Power Plant consists of two generating units with a release capacity of approximately 5,100 cfs (Reclamation, 2001). Power generation from this facility is continuous throughout the day.

3.2.2 Environmental Consequences

No Action

No change in hydrology or operations would occur under the No Action Alternative. Therefore, there would be no change in either hydropower or pumping energy requirements. Implementation of the No Action Alternative would result in no power supply impacts on CVP hydropower generation and capacity or pumping energy requirements.

Proposed Action

Potential power supply impacts include changes in CVP hydroelectric power generation and capacity, changes in pumping energy use by diverters that pump water from Folsom Reservoir, and changes to energy use within the WA service area. No other potential effects on power generation or demand are anticipated with implementation of the Proposed Action, with the exception of potential increases in the use of energy resources for pumping, conveyance, and treatment of the new water supply.

Changes in CVP power at the Folsom Power Plant could occur as the result of either a change in water surface elevation (head), which affects electrical capacity or altered power plant (penstock) releases, which affect electrical generation. Changes to pumping energy use by Folsom Reservoir diverters also could result from changes in surface water elevation. Lowering the Reservoir's water surface would create an increase in pumping lift so that the amount of energy required to move the water also would increase.

This analysis assumes that impacts would be significant if hydropower generation were substantially reduced, pumping energy requirements for Folsom Reservoir diverters were substantially increased, or electrical energy use were substantially increased, with implementation of the Proposed Action.

CALSIM studies show that implementation of the Proposed Action would have a small effect, both positive and negative, on reservoir water surface elevation in Folsom Reservoir (A-3); these data include wet, above normal, below normal, dry, and critical years. The changes throughout a year in monthly Folsom storage resulting from the Proposed Action can vary upwards and downwards from the No Action Alternative. Typically, the difference is ± 1 to 2 feet and compensating behavior is observed in subsequent monthly operations.

With implementation of the Proposed Action, Folsom Reservoir surface water elevations would increase and decrease slightly. These changes and the minor increases and decreases in flows below Nimbus Dam would be so small as to be unnoticeable in real-time operations. As a result, there would be no effect on hydropower generation at the Folsom or Nimbus power plants. Similarly effects on pumping at the Folsom Pumping Plant would not be identifiable.

An increase in energy requirement at the FLRWPS would be expected under the Proposed Action, because EID would be using these facilities to pump the increased diversion of 8,500 AFY. Because Folsom Reservoir elevations would change only slightly under the Proposed Action, the increase in energy requirement would be due entirely to the increased diversion by EID. EID would be financially responsible for the increased energy requirement.

The results of the studies and analysis were conducted to show the potential impacts on water supply and hydrology for the diversion of 17,000 AFY of Project 184 water at the FLRWSP; therefore, it is reasonable to assume that impacts under the Proposed Action for a diversion of 8,500 AFY would be less than those analyzed in the studies. No adverse impacts on CVP hydropower generation, pumping energy requirements, or area energy use as a result of the Proposed Action are anticipated.

3.3 Fisheries and Aquatic Resources

3.3.1 Affected Environment

The Proposed Action area consists of the American River from Folsom reservoir downstream to its confluence with the Sacramento River (lower American River). Completion of Folsom and Nimbus dams in 1955 permanently blocked upstream fish passage past river mile (RM) 23 and reportedly eliminated over 70 percent of historic Chinook salmon spawning habitat and the entire historic steelhead spawning habitat.

Seasonal releases from Folsom reservoir's CWP typically dictate thermal conditions in the lower American River that support annual in-river production of salmonid species. Folsom Reservoir's CWP is not always large enough to maintain coldwater releases during both (or either) the warmest months (July through September) to provide maximum thermal benefits to rearing juvenile steelhead, and/or during October and November to benefit fall-run Chinook salmon immigration, spawning, and embryo incubation. Consequently, lower American River temperature management is annually prescribed (in accordance with the 2009 NMFS BO) based on current conditions in an attempt to provide thermal benefits to both fall-run Chinook salmon and steelhead, within the constraints of CWP availability and facility operations. Lake Natoma serves as a regulating afterbay for Folsom Reservoir, and despite its relatively small size (an operating range of 2,800 AF), can substantially influence the temperature of water flowing from Folsom Reservoir to the lower American River. High residence times in Lake Natoma, particularly during summer months and when releases are low, have a warming effect on water released from Folsom Reservoir (Appendix D).

Although construction and operation of the Folsom Project has altered the flow and water temperature regimes in the lower American River, the river provides

spawning and rearing habitat for fish species. Forty-three fish species have been identified in the lower American River since completion of the Folsom Project, including native and introduced, resident and anadromous fishes. Several of these species are of primary management concern either due to their declining status or because of their importance as a recreational and/or commercial fishery. The action of EID's full contract amount of 17,000 AFY of water conveyed through Reclamation's facilities are included in the analysis of the 2009 NMFS BO under which the CVP is currently operating. Potential impacts to fisheries resources within the Proposed Action area that could result from the implementation of the Proposed Action were identified and evaluated (NMFS 2009). Further analysis was completed on three potential alternatives that consisted of the full WA amount of 17,000 AFY, 8,500 AFY (50%), and 5,100 AFY (30%) that could be diverted by EID through Reclamation facilities under Water Rights Permit 21112. The Proposed Action (8,500 AFY) resulted in an undetectable change when compared to the No Action Alternative and would meet the purpose and need of the Proposed Action (Appendix D).

Quantification of potential changes to temperatures and flows on the lower American River, supported by additional analysis of potential changes in Folsom Reservoir CWP volume, provides a reasonable metric for evaluating the range of potential effects to listed fish species and associated habitat downstream in the lower American River that could result due to the Proposed Action.

For Folsom Reservoir and the lower American River temperature modeling, a temperature change of less than 0.3 °F is assumed to be undetectable as it is less than the lower limit of accuracy of temperature measurement. Modeling showed that the full 17,000 AFY would result in a measurable detection (0.3 °F or greater) to the CWP, which, under the current 2009 NMFS RPA, triggers the construction of a TCD at the EID diversion. The modeling results for the 8,500 AFY alternative do not result in a detectable change to the CWP and therefore a TCD would not be required (Appendix D). A meaningful change in habitat is assumed to occur when the change in flow equals or exceeds approximately ten percent. The ten percent criterion is based on the assumption that changes in flow less than ten percent are generally not within the accuracy of flow and habitat measurements and would not result in measurable changes to fish habitat area.

The Proposed Action area encompasses waterways where the federally listed as threatened California Central Valley steelhead (*Oncorhynchus mykiss*) distinct population segment (DPS), threatened Central Valley spring-run Chinook salmon *(O. tshawytscha)* evolutionarily significant unit (ESU), and endangered Sacramento River winter-run Chinook salmon *(O. tshawytscha)* ESU have the potential to occur (USFWS species list 2014). In addition, the Proposed Action area is within EFH for Pacific salmon and designated critical habitat for the California Central Valley steelhead DPS and Central Valley spring-run Chinook salmon.

The effects of the 17,000 AFY were included in the analysis provided in the 2009 NMFS BO on the long-term operations of the CVP and SWP, and its associated reasonable and prudent alternative (RPA), as revised in 2011. Current CVP facilities are operating under the 2009 NMFS BO. Please refer to the analysis in the 2009 NMFS BO for additional information.

Special-Status Fish Species

Evaluating potential impacts on fishery resources within the Proposed Action area requires an understanding of fish species' life histories and life stage-specific environmental requirements. General information is provided below regarding life histories of fish species of primary management concern occurring within the Proposed Action area. Please refer to the analysis in the 2009 NMFS BO for additional information.

Central Valley Steelhead

The Central Valley Steelhead DPS is listed as threatened under FESA. This DPS includes all naturally spawned populations of steelhead in the Sacramento and San Joaquin Rivers and their tributaries. Steelhead reared at Nimbus Hatchery is not considered to be a part of the Central Valley Steelhead DPS because of their Eel River ancestry. The American River is included in the critical habitat designation for Central Valley steelhead (70 FR 52616). Critical habitat for steelhead extends upstream to Nimbus Dam (70 FR 52616). The primary constituent elements of critical habitat in the Action Area include freshwater rearing habitat and freshwater migration corridors that have adequate substrate, water quality and quantity, temperature, velocity, cover/shelter, food, riparian vegetation, space, and safe passage conditions. Naturally spawning populations are known to occur in the lower American River; however, their ancestry is not clearly known and they may have substantial hatchery influence (Busby et al., 1996). Hannon and Deason (2005) found that the majority of steelhead that spawned in the river from 2003 to 2005 were hatchery produced (71.4 to 93.7 percent). Additionally, steelhead runs in the lower American River are sustained largely by the Nimbus Hatchery (McEwan and Jackson, 1996). Hannon and Deason (2005) also found that the majority of steelhead adults returning to the lower American River entered the hatchery versus spawning in the river (more than 88 percent of the steelhead spawner population returned to Nimbus Hatchery), and that over 95 percent of the observed steelhead spawners (hatchery plus in-river spawning) were hatchery produced.

Adult steelhead immigration into the lower American River can occur as early as August; however, spawning typically begins in December and continues into April, peaking in late February (Hannon and Deason, 2005). Optimal immigration water temperatures have been reported to range from 46 to 52°F (7.8 to 11.1°C) (CDFW, 1991). Optimal steelhead spawning water temperatures are reported to range from 39 to 52°F (3.9 to 11.1°C) (CDFW, 1991). Unlike Chinook salmon, many steelhead do not die after spawning. Those that survive return to the ocean, and may spawn again in future years.

Fall-run Chinook Salmon

Chinook salmon in the Central Valley exhibiting fall- and late fall-run behavior (i.e., immigration timing) are considered by NMFS to be one evolutionarily significant unit (ESU), the Central Valley fall and late fall-run ESU. Therefore, both runs will be addressed simultaneously in this evaluation. Fall- and late fall-run Chinook salmon are of recreational/ commercial importance as well as a species of concern under FESA. Additionally, the fall- and late fall-run Chinook salmon ESU is a federally managed fish species for EFH in accordance with the Magnuson- Stevens Act. Although this species has no formal listing status under CESA, CDFW considers it a species of special concern.

Although considered a single ESU with late fall-run Chinook salmon, fall-run Chinook salmon (i.e., Chinook salmon exhibiting fall-run behavior) have been the dominant run in the lower American River since the 1940s (Water Forum, 2001). Adult fall-run Chinook salmon begin migrating upstream annually in August and September, with immigration continuing through December in most years and through January during some years. Adult immigration activities generally peak in November, and typically, greater than 90 percent of the run has entered the lower American River by the end of November (Snider and McEwan, 1992; Snider and Vyverberg, 1995). The immigration timing of fall-run Chinook salmon tends to be temporally similar from year-to-year because it is largely dictated by environmental and internal cues (e.g., photoperiod, gonadal maturation, and other seasonal environmental cues) that exhibit little year-to-year variation.

The timing of adult Chinook salmon spawning activity is strongly influenced by water temperature. Fall-run Chinook salmon spawning typically begins when daily average water temperatures decrease to approximately 60°F (15.6°C). Due to the timing of adult arrivals and occurrence of appropriate spawning water temperatures, spawning activity in the lower American River, for example, has peaks during mid- to late-November (Snider and McEwan, 1992; Snider and Vyverberg, 1995).

The intragravel residence period of incubating eggs and alevins (yolk-sac fry) is highly dependent upon water temperature and generally extends from about mid-October through March. Egg incubation survival rates are dependent on water temperature and intragravel water movement. CDFW (1980) reported egg mortalities of 80 percent and 100 percent for Chinook salmon at water temperatures of 61 and 63°F (16.1 and 17.2°C), respectively. Egg incubation survival is reportedly highest at water temperatures at or below 56°F (13.3°C) (USFWS, 1995; USFWS, 1999a).

Within the lower American River, fall-run Chinook salmon fry emergence generally occurs from late-December through mid-May. The majority of emergence occurs during February and March. Water temperatures between 45

and 58°F (7.2 and 14.4°C) have been reported to be optimal for rearing of Chinook salmon fry and juveniles (Rich, 1987; Reiser and Bjornn, 1991). Raleigh et al. (1986) reviewed available literature on Chinook salmon thermal requirements and suggested a suitable rearing water temperature range of approximately 53.6 to 64.4°F (12 to 18°C).

Spring-run Chinook Salmon

The American River is included in the critical habitat designation for Central Valley spring-run Chinook salmon (70 FR 52600). Current critical habitat for spring-run Chinook salmon extends approximately 10 miles of the American River from the confluence with the Sacramento River upstream to the Watt Avenue Bridge on the American River.

Historically, spring-run Chinook salmon occurred in the headwaters of all major river systems in the Central Valley where natural barriers were absent. Beginning in the 1880s, harvest, water development, construction of dams that prevented access to headwaters and habitat degradation significantly reduced the number and range of spring-run Chinook salmon in the Central Valley.

Construction of other low elevation dams in the foothills of the Sierras on the American, Mokelumne, Stanislaus, Tuolumne, and Merced Rivers extirpated spring-run from these watersheds (NMFS, 2009). Populations of spring-run Chinook salmon were previously assumed to be restricted to accessible reaches in the upper Sacramento River mainstem, Antelope Creek, Battle Creek, Beegum Creek, Big Chico Creek, Butte Creek, Clear Creek, Deer Creek, Feather River, Mill Creek, and the Yuba River (CDFW, 1998; USFWS, 1998; CALFED, 2000). However, spring-run Chinook salmon juveniles have been observed rearing in non-natal tributaries and intermittent streams during winter months (NMFS, 2004). As such, the lower 10 mile reach of the American River has been designated as critical habitat for spring-run Chinook salmon. Due to the significantly reduced range and size of remaining spring-run populations, the Central Valley spring-run Chinook salmon ESU is listed as threatened under both FESA and CESA. Additionally, the Central Valley spring-run Chinook salmon ESU is a federally managed fish species in accordance with the Magnuson-Stevens Act.

Adult spring-run Chinook salmon immigration and holding in the Central Valley Basin occurs from mid-February through July, and peaks during April through May (CDFW, 1998; Department and Reclamation, 1999; Lindley et al., 2004). Suitable water temperatures for adult upstream migration reportedly range between 57 and 67ºF (NMFS, 1997). In addition to suitable water temperatures, adequate flows are required to provide migrating adults with olfactory and other cues needed to locate their spawning reaches (CDFW, 1998).

Unlike fall- and late-fall-run Chinook salmon, spring-run Chinook salmon are sexually immature when they enter the freshwater environment and mature while

oversummering in areas near spawning grounds. Maximum water temperatures for adult spring-run Chinook salmon holding are reported to be approximately 59 to 60ºF (NMFS, 1997). Spring-run Chinook salmon spawn in the upper Sacramento River upstream of Red Bluff Diversion Dam, the lower Yuba River, and the lower Feather River. Spawning and embryo incubation has been reported to primarily occur during September through mid-February, with spawning peaking in mid-September (Vogel and Marine, 1991; Moyle, 2002). Although some portion of an annual year-class may emigrate as post-emergent fry (individuals less than 45 mm in length), most are believed to rear in the upper Sacramento river and tributaries during the winter and spring and emigrate as juveniles (individuals greater than 45 mm in length, but not having undergone smoltification) or smolts (silvery colored fingerlings having undergone the smoltification process in preparation for ocean entry).

Juvenile emigration timing varies among the tributaries of origin, and can occur from October through April (Vogel and Marine, 1991). November and December may be key months for spring-run Chinook salmon emigration from the lower Feather River (DWR and Reclamation, 1999; Painter et al., 1977). Most emigration from Butte Creek is reported to occur between January and March (Lindley et al., 2004). Some juveniles also continue to rear in Butte Creek through the summer and emigrate as yearlings from October to February, with peak yearling emigration occurring in November and December (CDFW, 1998). Non-natal rearing spring-run Chinook salmon juveniles would be expected to be present in the American River from November through June.

Winter-run Chinook Salmon

The Sacramento River winter-run Chinook salmon ESU is listed as endangered under both FESA and CESA. In 1993, critical habitat for winter-run Chinook salmon was designated to include the Sacramento River from Keswick Dam (RM 302) to Chipps Island (RM 0) at the westward margin of the Sacramento-San Joaquin Delta. Also included are waters west of the Carquinez Bridge, Suisun Bay, San Pablo Bay, and San Francisco Bay north of the San Francisco/Oakland Bay Bridge (NMFS, 1993).

Adult winter-run Chinook salmon immigration and holding (upstream spawning migration) through the Delta and into the lower Sacramento River occurs from December through July, with a peak during the period extending from January through April (USFWS, 1995b). Winter-run Chinook salmon primarily spawn in the main-stem Sacramento River between Keswick Dam and Red Bluff Diversion Dam (RM 243). They spawn between late-April and mid-August, with a peak generally in June. Incubation can extend into October (Vogel and Marine, 1991).

Winter-run Chinook salmon fry abundance peaks in the upper Sacramento River during September. Juvenile emigration past Red Bluff Diversion Dam occurs from July through March (Reclamation, 1992; Vogel and Marine, 1991), although NMFS (NMFS, 1993; NMFS, 1997) reports juvenile rearing and outmigration

extending from June through April. Emigration (downstream migration) of winter-run Chinook salmon juveniles past Knights Landing, approximately 155.5 RM's downstream of the Red Bluff Diversion Dam, reportedly occurs between November and March, peaking in December, with some emigration continuing through May in some years (Snider and Titus 2000a; Snider and Titus 2000b). The numbers of juvenile winter-run Chinook salmon caught in rotary screw traps at the Knights Landing sampling location were reportedly dependent on the magnitude of flows during the early fall portion of the emigration period (Snider and Titus 2000a; Snider and Titus 2000b). Winter-run Chinook salmon juveniles would be expected to be present in the American River from August to October. Additional information on the life history and habitat requirements of winter-run Chinook salmon is contained in the 2009 NMFS BO for this run, which was developed to specifically evaluate impacts on winter-run Chinook salmon associated with CVP and SWP operations (NMFS, 2009). Non-natal winter-run juvenile rearing would be expected to occur in the American River from early fall through winter.

3.3.2 Environmental Consequences

No Action

Under the No Action Alternative, no change in hydrology or operations would occur. Therefore, there would be no anticipated adverse effects on fisheries.

Proposed Action

The action of EID's full WA contract amount of 17,000 AFY of water conveyed through Reclamation's facilities are included in the analysis of the 2009 NMFS BO under which the CVP is currently operating. Potential impacts to fisheries resources within the Proposed Action area that could result from the implementation of the Proposed Action were identified and evaluated (NMFS 2009). Further analysis was completed on three potential alternatives that consisted of the full WA amount of 17,000 AFY, 8,500 AFY (50%), and 5,100 AFY (30%) that could be diverted by EID through Reclamation facilities under Water Rights Permit 21112(See Appendix D).

For Folsom Reservoir and the lower American River temperature modeling, a temperature change of less than 0.3 °F is assumed to be undetectable as it is less than the lower limit of accuracy of temperature measurement. Modeling showed that the full 17,000 AFY would result in a measurable detection (0.3 °F or greater) to the CWP, which, under the current 2009 NMFS RPA, triggers the construction of a TCD at the EID diversion. The modeling results for the 8,500 AFY alternative do not result in a detectable change to the CWP and therefore a TCD would not be required. A meaningful change in habitat is assumed to occur when the change in flow equals or exceeds approximately ten percent. The ten percent criterion is based on the assumption that changes in flow less than ten percent are generally not within the accuracy of flow and habitat measurements and would not result in measurable changes to fish habitat area.

Quantification of potential changes to temperatures and flows on the lower American River, supported by additional analysis of potential changes in Folsom Reservoir CWP volume, provides a reasonable metric for evaluating the range of potential effects to listed fish species and associated habitat downstream in the lower American River that could result due to the Proposed Action. Overall, the Proposed Action would not result in changes in flow, flow fluctuation, or water temperature increases of sufficient magnitude or duration to appreciably affect listed fish species or associated habitat.

Steelhead

In the lower American River, steelhead immigration generally extends from November through March. The mean monthly water temperature during the steelhead adult immigration life stage is essentially the same under the Proposed Action and the No Action Alternative (Table A-6). The steelhead spawning and incubation life stage occurs from December through April. Peak steelhead spawning habitat availability occurs at 1,800 cfs. Mean monthly water temperature during the steelhead spawning and incubation life stage is essentially the same under the Proposed Action, relative to the No Action Alternative and would not cause water temperatures to exceed the suitable range for this life stage. Flow fluctuations could affect juvenile steelhead rearing and emigration. The Proposed Action would result in an undetectable change in reservoir storage capacity and in flow magnitude and as such would not change the occurrence or magnitude of flow fluctuations. Under the Proposed Action, changes in river flow or water temperature of sufficient magnitude or duration would not be expected to affect habitat availability or habitat suitability to a level that would cause harm to steelhead.

Fall-run Chinook Salmon

In the lower American River, fall-run Chinook salmon adult immigration life stage is from September through December. The fall-run Chinook salmon spawning and incubation life stages occur from October through March. Depending upon the location and temperature, peak spawning habitat availability occurs between 1,000 and 3,000 cfs. Fall-run Chinook salmon juvenile rearing and emigration life stages occur from late-December through June. Hydrologic and temperature modeling results (Table A-7) for the full 17,000 AFY indicate water temperature exceedence distributions are not expected to change during the September through December period. Typically by mid-November ambient climatic conditions strongly influence downstream water temperatures. The Proposed Action would not result in changes in flow, flow fluctuation, or water temperature increases of sufficient magnitude or duration to impact fall-run Chinook salmon.

Spring-run Chinook Salmon

Juvenile spring-run Chinook salmon are occasionally observed rearing (i.e., non-natal rearing) in the lower 10 miles of the American River during late-winter to

early-spring period. Mean monthly flows in the lower American River during non-natal rearing are greater than 3,000 cfs.

Flow fluctuations could affect spring-run Chinook salmon non-natal rearing. However, the Proposed Action would result in minimal change in reservoir storage capacity or in flow magnitude and as such would not change the occurrence or magnitude of flow fluctuations during the late winter to early spring. In addition, modeled water temperature (Table A-5) conditions indicate that water temperature during juvenile non-natal rearing (January through April) would be undetectable under the Proposed Action (Mean monthly water temperature increases were less than the minimum measureable level of 0.3^{o}F). The Proposed Action would not affect the physical habitat conditions to a level that affects juvenile spring-run Chinook salmon rearing conditions or cause harm to spring-run Chinook salmon during the juvenile non-natal rearing period.

Winter-run Chinook Salmon

Winter-run Chinook salmon are rarely observed in the lower American River; however, juveniles may be present between August and October, and non-natal juveniles may rear in the lower American River from early fall through winter.

Flow fluctuations could affect winter-run non-natal rearing. However, the Proposed Action would result in minimal change in reservoir storage capacity or in flow magnitude and as such would not change the occurrence or magnitude of flow fluctuations during non-natal rearing periods.

Overall, the Proposed Action would not result in changes in flow, flow fluctuation, or water temperature increases of sufficient magnitude or duration to appreciably affect listed species or their habitat.

3.4 Terrestrial and Riparian Resources

This section describes the existing conditions of terrestrial and riparian resources and consists of identification of communities and associated special-status plant and wildlife species with the potential to occur in the Action Area.

3.4.1 Affected Environment

Folsom Reservoir and Lake Natoma

Habitats associated with Folsom Reservoir include non-native grassland, blue oak-pine woodland, and mixed oak woodland. Oak-pine woodlands and non-native grasslands in the reservoir area support a variety of birds. A number of raptor species also utilize oak woodland habitats for nesting, foraging, and roosting. Many mammal species occur in the woodland. Amphibians and reptiles are found in oak woodlands. The primary vegetation around Lake Natoma consists of cottonwoods, poison oak, and wild grape (*Vitis californica*). Wildlife communities found at Lake Natoma are similar to those found at Folsom Reservoir. Federal and State listed and proposed candidate species of the area

include the valley elderberry longhorn beetle, California red-legged frog, mountain yellow-legged frog, pallid bat, northwestern pond turtle, giant garder snake, tricolored blackbird, bald eagle, California black rail, purple martin, Boggs Lake hedge-hyssop and Stanford's arrowhead.

Lower American River

The lower American River provides a diverse assemblage of vegetation communities, including freshwater marsh and emergent wetland, riparian scrub, riparian forest, and in the upper, drier areas farther away from the river, oak woodland and non-native grassland. More than 220 species of birds have been recorded along the lower American River and more than 60 species are known to nest in the riparian habitats (USFWS 1991). Additionally, more than 30 species of mammals reside along the river. The most common reptiles and amphibians that depend on the riparian habitats along the river include western toad (*Bufo* boreas), Pacific tree frog (*Hyla* regilla), bullfrog (*Rana* catesbeiana), western pond turtle (*Clemmys marmorata*), western fence lizard (*Sceloporus occidentalis*), common garter snake (*Thamnophis sirtalis*), and gopher snake (*Pituophis catenifer*).

EID's Long-Term Warren Act Contract Service Area

The service area is centered on the El Dorado Hills and Cameron Park region of El Dorado County, an area that has been subjected to a large amount of residential development. Much of the natural vegetation within the service area has been removed, reduced in extent, or disturbed by human activities.

Several different major habitat types can be found throughout the service area based on vegetation maps contained in the *El Dorado County General Plan Environmental Impact Report* (EDC, 2003). The major vegetation communities in the service area include annual grassland, chaparral, blue oak woodland, blue oak-foothill pine, and montane hardwood. Generally, all the habitats within the service area are highly fragmented and disturbed by humans. Small areas of riparian and wetland habitat are also present in the service area, although they are limited in extent and are uncommon. Areas with substantial habitat remaining occur in the northern portion of the service area at the Pine Hill Preserve.

Oak woodlands provide habitat for more than 100 species of birds, 60 species of mammals, 80 species of amphibians and reptiles, and 5,000 species of insects (Verner and Boss, 1980; Pavlik et al., 1991). Blue oak-foothill pine, another major habitat type in the service area, provides suitable breeding habitat for 29 species of amphibians and reptiles, 70 species of birds, and 22 species of mammals (Verner and Boss, 1980).

3.4.2 Environmental Consequences

No Action

No change in riparian or terrestrial resources would occur under the No Action Alternative. Therefore, there would be no adverse impacts on terrestrial and riparian resources within the Action Area.

Proposed Action

With implementation of the Proposed Action, Folsom Reservoir storage would decrease less than 0.4 percent in July through September, and the remainder of the year would exhibit less of a change. A change of less than 0.4 percent would most likely not be perceptible; and therefore, would not be noticeable in the reservoir. Flows in the lower American River would decrease less than 1.7 percent in September, while the remainder of the year would exhibit less of a change. A less than 1.7 percent change would fall within the margin of error of local stream gages; therefore, the change would not be noticeable in the river. As a result, there would be negligible impacts on terrestrial and riparian resources at Folsom Reservoir, and along the American River with implementation of the Proposed Action.

3.5 Cumulative Impacts

Cumulative impacts are defined in Council on Environmental Quality Regulations (40 CFR 1508.7 and 1508.25) as follows:

"Cumulative impact is the impact on the environment, which results from the incremental impact of the action when added to past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

The potential for the Proposed Action to result in cumulative impacts to the surrounding environment was analyzed by comparing the Proposed Action to other past, present and reasonably foreseeable actions, which are identified in Tables 3-1, 3-2 and 3-3. Reclamation can satisfy these contractual agreements in years when excess capacity is available in Folsom; however, these actions are superseded by other operational requirements on the lower American River.

Reclamation operates Folsom Reservoir to conserve Folsom's CWP, and to satisfy lower temperature and flow requirements in the lower American River. Reclamation's operational mandates are in place to meet temperature and flow standards to protect listed species and their critical habitats in the lower American River, and to enhance water quality in the Delta. Once these environmental conditions have been met, Reclamation then operates Folsom Reservoir to provide flood protection and to meet CVP water demands for the American River contractors. In years when excess capacity is available in Folsom and all operational priorities have been met, Reclamation can operate Folsom Reservoir to satisfy the storage and conveyance contracts for non-CVP water. Reclamation operates Folsom Reservoir within the existing BOs for the CVP/SWP; therefore, all storage and conveyance of non-CVP water in Folsom will be subject to the requirements set forth in the respective BOs.

The Proposed Action is a temporary WA contract which means that it would only be approved for a limited five year timeframe, as specified. The Proposed Action, when added to other past, present, and reasonably foreseeable future actions, would not result in cumulative effects to the surrounding environment, Folsom Reservoir operations, water supply or hydropower.

The determination for cumulative effects was based on potential impacts associated to the Proposed Action; diversion of 8,500 AFY of EID's Project 184 water at their FLRWPS and the potential to impact the CWP. Appendix D contains a detailed analysis of the potential impacts to the Folsom Reservoir CWP under direct diversions at the FLRWPS under 30%, 50% and 100% diversion rates of the 17,000 AF of Project 184 water. This analysis provides rationale for why the Proposed Action of diverting no more than 8,500 AFY will avoid impacts to the CWP in lieu of a TCD. There is a possibility that EID will explore options in the future to divert the remaining 8,500 AF of their 17,000 AF of Project 184 water from the FLRWPS. Any future actions associated to the diversion of the remaining 8,500 AF of water would be addressed under a separate environmental review process. Cumulative impacts associated to any future actions would be evaluated and updated to reflect the potential impacts to the affected environment.

Table 3-1 Current WA Contracts and Water Rights Settlement Contracts through Folsom Reservoir

Contractor	Amount of Water	Term of Contract
EID	4,560 AFY	40 years
EID	23,000 AFY	No Expiration
City of Folsom	22,000 AFY	No Expiration
Folsom State Prison	4,000 AFY	No Expiration
Foresthill PUD	2,800 AFY	Title Transfer of Reclamation's former Sugar Pine Unit
Golden State Water Company	10,000 AFY	No Expiration
PCWA	100 AFY	5 years
City of Roseville	30,000 AFY	25 Years
Sacramento Municipal Utility District (SMUD)	15,000 AFY	2 years
City of Sacramento	245,000 AFY (Quantity varies from year to year)	No Expiration Date
Sacramento Suburban WD (SSWD)	14,500 AFY	5 Years
San Juan WD (SJWD)	25,00 AFY	5 Years
SJWD	33,000 AFY	No Expiration
Westlands Water District (WWD)	35,000 AFY	1 Year
Total Amount	218,960 (Not including City of Sacramento's 250 TAF)	

Table 3-2 Possible Future WA Contracts through Folsom Reservoir

Contractor	Amount of Water	Term of Contract
EID	17,000 AFY	40 Years
EBMUD	47,000 AFY	40 Years
SMUD	15,000 AFY	5 Years
SSWD	29,000 AFY	Long-term
Total Amount	108,000 AFY	

Table 3-3 Current Interim & Pending CVP Water Service Contracts on the American River

Contractor	Amount of Water	Term of Contract
El Dorado County Water Agency (EDCWA), possibly split with EID & Georgetown Divide PUD (7.5 TAF each)	15,000 AFY	40 Years
City of Roseville	32,000 AFY	2 Years
Sacramento County Water Agency (SCWA)	30,000 AFY	2 Years
SMUD	30,000 AFY	2 Years
Total Amount	107,000 AFY	

Section 4 Consultation and Coordination

4.1 Public Review Period

Reclamation intends to sign a Finding of No Significant Impact for this project, and will make the environmental assessment available for public comment. All comments will be addressed in the Finding of No Significant Impact. Additional analysis will be prepared if substantive comments identify impacts that were not previously analyzed or considered. Reclamation indents to provide the public with an opportunity to comment on the Draft EA between November 19, 2014 and December 3, 2014.

4.2 Fish and Wildlife Coordination Act (16 U.S.C. § 661 et seq.)

The Fish and Wildlife Coordination Act (FWCA) requires that Reclamation consult with fish and wildlife agencies (federal and state) on all water development projects that could affect biological resources.

4.3 Endangered Species Act (16 U.S.C. § 1531 et seq.)

Section 7 of the Endangered Species Act requires Federal agencies, in consultation with the Secretary of the Interior and/or Commerce, to ensure that their actions do not jeopardize the continued existence of endangered or threatened species, or result in the destruction or adverse modification of the critical habitat of these species.

On May 17, 2012, Reclamation submitted a Biological Assessment (BA) to NMFS requesting concurrence on the conclusion that the Proposed Action to enter into a 40-year LTWA contract with EID for the delivery of up to 17,000 AFY of non-project water through Folsom Reservoir for M&I use "may affect, but is not likely to adversely affect" federally listed as threatened California Central Valley steelhead (*Oncorhynchus mykiss*) distinct population segment (DPS), threatened Central Valley spring-run Chinook salmon (*O. tshawytscha*) environmentally significant unit (ESU), and endangered Sacramento River winter-run Chinook salmon (*O. tshawytscha*) ESU, or the designated critical habitats for the Central Valley steelhead DPS and Central Valley spring-run Chinook salmon ESU. In addition, Reclamation determined that the proposed project may adversely affect essential fish habitat (EFH) for Pacific salmon, and requested initiation of consultation pursuant to provisions of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). The letter also served as consultation under the authority of, and in accordance

with, the provisions of the Fish and Wildlife Coordination Act of 1934 (FWCA), as amended.

ESA consultation was initially requested on December 15, 2011. On April 3, 2012, NMFS issued a letter requesting additional information before Section 7 consultation could be initiated. In addition, the letter outlined additional information required in an EFH assessment.

On May 17, 2012, NMFS received an amended BA and the additional materials required to initiate consultation. NMFS concluded that the information provided was adequate to initiate Section 7 consultation and contained sufficient detail to determine the extent to which the Proposed Action may affect federally listed species.

On May 22, 2012, NMFS issued a letter to Reclamation that concurred with Reclamation's determination that the Proposed Action "may affect, but is not likely to adversely affect" the threatened California Central Valley steelhead DPS, threatened Central Valley spring-run Chinook salmon ESU, endangered Sacramento River winter-run Chinook salmon ESU, or the designated critical habitats of the California Central Valley steelhead DPS and the Central Valley spring-run Chinook salmon ESU. The concurrence is supported by the following factors:

1. EID will utilize gages to measure the volume of water introduced to and diverted from Folsom Reservoir to ensure that the volume of water diverted from Folsom Reservoir is no more than equal to the volume of water introduced into Folsom Reservoir. EID will provide monthly reports to Reclamation, summarizing daily operations, before the 15th day of the succeeding month throughout the duration of the Proposed Project.

2. The quality of the non-project water entering CVP facilities will be monitored according to the SWRCB Permit 21112 Water Quality monitoring Plan and will not degrade the quality of the CVP water in the Federal facilities.

3. EID will install a TCD on water supply intake as a pre-condition to diverting any quantity exceeding 8,500 AFY or contribute an equivalent amount of money towards the cost of modifications to improve temperature management in Folsom Reservoir, in coordination with Reclamation.

4. EID will develop a Water Conservation Plan as well as provide a Temperature Management Plan each year to ensure no impacts on Folsom Reservoir's CWP will occur.

5. EID will adhere to restrictions on diversions set forth by Reclamation and/or applicable BO's to ensure this project will not result in any decrease to the available CWP in Folsom Reservoir.

6. Until such a time as EID has constructed a TCD or alternative modifications to improve temperature management in Folsom Reservoir have been made in coordination with Reclamation, any water removed from Folsom Reservoir for the purposes of this contract must be taken from the warmer surface layer in Folsom Reservoir or EID must identify in their submitted Temperature Management Plan the restrictions they will impose on themselves to ensure the CWP will not be negatively affected by the Proposed Project.

Upon receipt of the NMFS concurrence for determination of project effects on listed species, EID has decided to phase the project to limit diversions to 8,500 AFY on non-project water in order to remain consistent with the guidelines listed above. EID may pursue future actions to divert the remaining 8,500 AFY of their Project 184 water. Those actions will remain consistent with the NMFS determination for Section 7 concurrence, as well as the 2008, 2009 BO's issued by the USFWS and NMFS, respectively.

The Proposed Action is consistent with: (1) CALFEDs 2000 Ecosystem Restoration Program Plan (ERPP) and Multi-Species Conservation Strategy (MSCS); (2) the programmatic determinations for the CALFED program, which include CDFWs Natural Community Conservation Planning Act (NCCPA) approval and the 2009 NMFS, 2008 USFWS and 2004/2005 BOs; (3) USFWSs 1997 Draft Anadromous Fish Restoration Program (AFRP), which identifies specific actions to protect anadromous salmonids; (4) CDFWs 1996 Steelhead Restoration and Management Plan for California, which identifies specific actions to protect steelhead; and (5) CDFWs Restoring Central Valley Streams, A Plan for Action (1993), which identifies specific actions to protect salmonids.

4.4 National Historic Preservation Act (16 U.S.C. § 470 et seq.)

The NHPA of 1966, as amended (16 U.S.C. 470 et seq.), requires that federal agencies give the Advisory Council on Historic Preservation an opportunity to comment on the effects of an undertaking on historic properties, properties that are eligible for inclusion in the National Register. The 36 CFR Part 800 regulations implement Section 106 of the NHPA.

Section 106 of the NHPA requires federal agencies to consider the effects of federal undertakings on historic properties, properties determined eligible for inclusion in the National Register. Compliance with Section 106 follows a series of steps that are designed to identify interested parties, determine the APE,

conduct cultural resource inventories, determine if historic properties are present within the APE, and assess effects on any identified historic properties.

4.5 Indian Trust Assets

ITA's are legal interests in property held in trust by the United States for federally-recognized Indian tribes or individual Indians. An Indian trust has three components: (1) the trustee, (2) the beneficiary, and (3) the trust asset. ITA can include land, minerals, federally-reserved hunting and fishing rights, federally-reserved water rights, and in-stream flows associated with trust land. Beneficiaries of the Indian trust relationship are federally-recognized Indian tribes with trust land; the United States is the trustee. By definition, ITA cannot be sold, leased, or otherwise encumbered without approval of the United States. The characterization and application of the United States trust relationship have been defined by case law that interprets Congressional acts, executive orders, and historic treaty provisions.

The Proposed Action would not affect ITAs because there are none located in the Proposed Project area.

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Appendix A: CalSim II and Fishery Modeling for 17,000 AF Warren Act

Table A-1 Long-term and Water Year Type Averages of Folsom Reservoir End of Month Storage Under the 17,000 AF WA and No Action Alternative Conditions

Analysis Period	Average Storage (1,000 AF)											
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Long-term Full Simulation Period[1]												
No Action Alternative	548	500	495	499	506	611	737	862	832	711	635	560
17,000 AF WA	545	499	494	499	507	611	737	862	831	712	632	558
Difference	-3	-1	-1	0	1	0	0	0	-1	1	-3	-2
Percent Difference[2]	-1	0	0	0	0	0	0	0	0	0	0	0
Water Year Types[3]												
Wet												
No Action Alternative	586	536	534	522	501	634	794	967	964	891	780	646
17,000 AF WA	584	536	535	522	501	633	794	967	964	891	779	646
Difference	-2	0	1	0	0	-1	0	0	0	0	-1	0
Percent Difference	0	0	0	0	0	0	0	0	0	0	0	0
Above Normal												
No Action Alternative	519	465	468	530	530	644	796	969	953	811	735	640
17,000 AF WA	510	459	464	530	530	643	796	968	950	809	738	641
Difference	-9	-6	-4	0	0	-1	0	-1	-3	-2	3	1
Percent Difference	-2	-1	-1	0	0	0	0	0	0	0	0	0
Below Normal												
No Action Alternative	552	513	498	522	552	650	792	937	904	749	671	594
17,000 AF WA	551	511	496	523	554	652	791	937	906	754	666	593
Difference	-1	-2	-2	1	2	2	-1	0	2	5	-5	-1
Percent Difference	0	0	0	0	0	0	0	0	0	1	-1	0
Dry												
No Action Alternative	541	503	509	500	535	629	741	818	738	571	516	502
17,000 AF WA	540	502	508	497	532	628	738	815	735	564	512	499
Difference	-1	-1	-1	-3	-3	-1	-3	-3	-3	-7	-4	-3
Percent Difference	0	0	0	-1	-1	0	0	0	0	-1	-1	-1
Critical												
No Action Alternative	498	435	408	388	398	457	487	506	480	384	356	338
17,000 AF WA	496	438	410	391	402	461	490	509	482	402	349	330

Difference	-2	3	2	3	4	4	3	3	2	18	-7	-8
Percent Difference	0	1	0	1	1	1	1	1	0	5	-2	-2

[1] Based on the 82-year simulation period
[2] Relative difference of the monthly average
[3] As defined by the Sacramento Valley 40-30-30 Index Water Year Hydrologic Classification (SWRCB, 1995)

Table A-2 Long-term and Water Year Type Average for Lower American River Flow below Nimbus Dam Under the 17,000 AF WA and No Action Alternative Conditions

Analysis Period	Monthly Mean Flow (cfs)											
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Long-term Full Simulation Period[1]												
No Action Alternative	1,501	2,931	3,663	4,670	5,402	3,798	3,401	3,619	3,837	3,608	2,645	2,705
17,000 AF WA	1,497	2,899	3,653	4,655	5,391	3,795	3,378	3,591	3,796	3,526	2,672	2,675
Difference	-4.4	-31.5	-10.6	-15.2	-10.9	-3.5	-22.3	-27.7	-41.6	-82.9	26.6	-29.2
Percent Difference[2]	-0.3	-1.1	-0.3	-0.3	-0.2	-0.1	-0.7	-0.8	-1.1	-2.3	1.0	-1.1
Water Year Types[3]												
Wet												
No Action Alternative	1,637	3,761	6,493	8,987	9,354	6,101	5,358	6,213	6,123	3,907	3,670	4,052
17,000 AF WA	1,638	3,736	6,481	8,993	9,350	6,106	5,324	6,181	6,078	3,858	3,638	4,028
Difference	1.3	-25.2	-11.3	5.8	-4.1	4.8	-33.8	-32.0	-44.5	-49.1	-32.1	-23.2
Percent Difference	0.1	-0.7	-0.2	0.1	0.0	0.1	-0.6	-0.5	-0.7	-1.3	-0.9	-0.6
Above Normal												
No Action Alternative	1,485	3,441	3,339	5,195	6,605	5,465	3,628	3,933	3,410	3,898	2,810	3,165
17,000 AF WA	1,481	3,388	3,292	5,139	6,599	5,482	3,579	3,902	3,414	3,830	2,709	3,152
Difference	-4.0	-53.1	-47.1	-55.9	-5.9	17.2	-49.3	-30.9	3.9	-68.0	-101.1	-12.8
Percent Difference	-0.3	-1.5	-1.4	-1.1	-0.1	0.3	-1.4	-0.8	0.1	-1.7	-3.6	-0.4
Below Normal												
No Action Alternative	1,450	2,431	2,760	2,674	4,366	2,458	3,317	2,962	3,149	4,036	2,731	2,796
17,000 AF WA	1,450	2,435	2,762	2,614	4,353	2,455	3,326	2,932	3,068	3,939	2,847	2,714
Difference	0.0	3.3	2.8	-60.1	-12.7	-2.7	9.1	-29.5	-81.3	-97.5	115.5	-81.7
Percent	0.0	0.1	0.1	-2.2	-0.3	-0.1	0.3	-1.0	-2.6	-2.4	4.2	-2.9

Difference												
Dry												
No Action Alternative	1,438	2,268	1,821	1,790	2,393	2,260	1,918	1,810	2,839	3,607	2,046	1,539
17,000 AF WA	1,426	2,257	1,825	1,804	2,384	2,230	1,906	1,791	2,790	3,627	1,954	1,510
Difference	-11.6	-10.6	3.9	13.6	-8.8	-29.6	-12.0	-19.8	-48.8	20.5	-91.3	-28.7
Percent Difference	-0.8	-0.5	0.2	0.8	-0.4	-1.3	-0.6	-1.1	-1.7	0.6	-4.5	-1.9
Critical												
No Action Alternative	1,376	2,198	1,676	1,442	1,361	1,014	1,255	1,165	1,613	2,175	1,057	967
17,000 AF WA	1,365	2,102	1,666	1,431	1,329	1,010	1,232	1,140	1,589	1,866	1,412	970
Difference	-11.2	-95.6	-9.8	-10.8	-32.0	-4.6	-22.9	-24.9	-23.7	-308.8	355.1	2.2
Percent Difference	-0.8	-4.4	-0.6	-0.7	-2.4	-0.5	-1.8	-2.1	-1.5	-14.2	33.6	0.2

[1] Based on the 82-year simulation period
[2] Relative difference of the monthly average
[3] As defined by the Sacramento Valley 40-30-30 Index Water Year Hydrologic Classification (SWRCB, 1995)

Table A-3 Long-term and Water Year Type Average of Folsom Reservoir End of Month Elevations Under the 17,000 AF WA and No Action Alternative Conditions

Analysis Period	Average Elevation (feet msl)											
	Oct	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**
Long-term Full Simulation Period[1]												
No Action Alternative	420	414	414	414	415	429	442	454	451	438	430	422
17,000 AF WA	420	414	414	414	415	429	442	454	451	438	429	422
Difference	0	0	0	0	0	0	0	0	0	0	-1	0
Percent Difference[2]	0	0	0	0	0	0	0	0	0	0	0	0
Water Year Types[3]												
Wet												
No Action Alternative	425	419	419	418	415	432	448	465	465	458	447	434
17,000 AF WA	425	419	419	418	415	431	448	465	465	458	447	433
Difference	0	0	0	0	0	-1	0	0	0	0	0	-1
Percent Difference	0	0	0	0	0	0	0	0	0	0	0	0
Above Normal												
No Action Alternative	415	408	410	419	419	433	449	465	464	450	443	433
17,000 AF WA	413	407	409	419	419	433	449	465	463	450	443	433
Difference	-2	-1	-1	0	0	0	0	0	-1	0	0	0
Percent Difference	0	0	0	0	0	0	0	0	0	0	0	0
Below Normal												
No Action Alternative	420	416	414	417	421	434	448	462	459	443	435	427

17,000 AF WA	420	416	414	418	422	434	448	462	459	444	435	427
Difference	0	0	0	1	1	0	0	0	0	1	0	0
Percent Difference	0	0	0	0	0	0	0	0	0	0	0	0
Dry												
No Action Alternative	420	415	416	415	419	431	443	451	442	423	417	415
17,000 AF WA	420	415	416	415	419	431	443	450	442	422	416	415
Difference	0	0	0	0	0	0	0	-1	0	-1	-1	0
Percent Difference	0	0	0	0	0	0	0	0	0	0	0	0
Critical												
No Action Alternative	414	406	402	398	400	409	413	415	412	398	393	391
17,000 AF WA	414	406	403	399	400	410	413	416	412	401	393	390
Difference	0	0	1	1	0	1	0	1	0	3	0	-1
Percent Difference	0	0	0	0	0	0	0	0	0	1	0	0

[1] Based on the 82-year simulation period
[2] Relative difference of the monthly average
[3] As defined by the Sacramento Valley 40-30-30 Index Water Year Hydrologic Classification (SWRCB, 1995)

Table A-4 Long-term and Water Year Type Count of Elevation Decreases of Greater than Six Feet at Folsom Reservoir Under the 17,000 AF WA and No Action Alternative Conditions

Analysis Period	Number of Months with Elevation Decreases Greater than Six Feet											
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Long-term Full Simulation Period[1]												
No Action Alternative	6	45	13	11	6	0	0	1	17	63	47	43
17,000 AF WA	5	46	15	11	6	0	0	1	16	62	49	44
Difference	-1	1	2	0	0	0	0	0	-1	-1	2	1
Percent Difference[2]	-17	2	15	0	0	0	0	0	-6	-2	4	2
Water Year Types[3]												
Wet												
No Action Alternative	2	14	3	4	4	0	0	0	0	10	21	24
17,000 AF WA	2	15	3	4	4	0	0	0	0	10	21	24
Difference	0	1	0	0	0	0	0	0	0	0	0	0
Percent Difference	0	7	0	0	0	0	0	0	0	0	0	0
Above Normal												
No Action Alternative	2	5	1	1	0	0	0	0	1	11	5	10
17,000 AF WA	2	6	1	1	0	0	0	0	1	11	5	10
Difference	0	1	0	0	0	0	0	0	0	0	0	0
Percent Difference	0	20	0	0	0	0	0	0	0	0	0	0
Below Normal												
No Action Alternative	0	9	2	0	0	0	0	0	3	13	10	7
17,000 AF WA	0	8	3	0	0	0	0	0	3	13	10	7
Difference	0	-1	1	0	0	0	0	0	0	0	0	0
Percent Difference	0	-11	50	0	0	0	0	0	0	0	0	0
Dry												
No Action Alternative	1	11	2	1	1	0	0	0	11	18	9	2
17,000 AF WA	0	11	2	2	1	0	0	0	10	18	9	2

Analysis Period	Number of Months with Elevation Decreases Greater than Six Feet											
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Difference	-1	0	0	1	0	0	0	0	-1	0	0	0
Percent Difference	-100	0	0	100	0	0	0	0	-9	0	0	0
Critical												
No Action Alternative	1	6	5	5	1	0	0	1	2	11	2	0
17,000 AF WA	1	6	6	4	1	0	0	1	2	10	4	1
Difference	0	0	1	-1	0	0	0	0	0	-1	2	1
Percent Difference	0	0	20	-20	0	0	0	0	0	-9	100	0

[1] Based on the 82-year simulation period
[2] Relative difference of the monthly average
[3] As defined by the Sacramento Valley 40-30-30 Index Water Year Hydrologic Classification (SWRCB, 1995)

Table A-5 Long-term and Water Year Type Averages for Lower American River Flows at Watt Avenue under the 17,000 AF WA and No Action Alternative

Analysis Period	Monthly Mean Flow (cfs)											
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Long-term Full Simulation Period[1]												
No Action Alternative	1,438	2,905	3,645	4,655	5,372	3,750	3,332	3,533	3,733	3,500	2,543	2,619
17,000 AF WA	1,434	2,874	3,635	4,640	5,362	3,747	3,310	3,506	3,692	3,418	2,570	2,590
Difference	-4.0	-31.2	-9.9	-14.7	-10.5	-2.9	-21.8	-27.3	-41.2	-82.5	27.4	-29.6
Percent Difference	-0.3	-1.1	-0.3	-0.3	-0.2	-0.1	-0.7	-0.8	-1.1	-2.4	1.1	-1.1
Water Year Types[2]												
Wet												
No Action Alternative	1,577	3,755	6,490	8,972	9,287	6,028	5,278	6,109	5,994	3,779	3,565	3,956
17,000 AF WA	1,578	3,730	6,479	8,978	9,283	6,033	5,244	6,077	5,950	3,730	3,533	3,933
Difference	1.8	-24.8	-10.8	6.2	-3.9	5.0	-33.8	-31.9	-44.2	-48.7	-31.7	-22.9
Percent Difference	0.1	-0.7	-0.2	0.1	0.0	0.1	-0.6	-0.5	-0.7	-1.3	-0.9	-0.6
Above Normal												
No Action Alternative	1,430	3,410	3,316	5,210	6,600	5,415	3,550	3,853	3,302	3,793	2,705	3,076
17,000 AF WA	1,426	3,357	3,270	5,155	6,595	5,434	3,502	3,823	3,307	3,725	2,604	3,064
Difference	-3.9	-52.6	-46.0	-54.9	-4.7	19.5	-48.1	-29.5	5.0	-68.1	-100.4	-11.9
Percent Difference	-0.3	-1.5	-1.4	-1.1	-0.1	0.4	-1.4	-0.8	0.2	-1.8	-3.7	-0.4
Below Normal												
No Action Alternative	1,380	2,403	2,736	2,653	4,361	2,413	3,264	2,875	3,051	3,933	2,625	2,711
17,000 AF WA	1,381	2,407	2,739	2,593	4,349	2,411	3,273	2,845	2,970	3,837	2,741	2,628
Difference	0.8	3.6	3.0	-59.8	-11.9	-2.3	9.1	-29.7	-81.1	-96.7	116.3	-82.8
Percent Difference	0.1	0.1	0.1	-2.3	-0.3	-0.1	0.3	-1.0	-2.7	-2.5	4.4	-3.1
Dry												

Analysis Period	Monthly Mean Flow (cfs)											
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Long-term Full Simulation Period[1]												
No Action Alternative	1,370	2,234	1,799	1,766	2,370	2,231	1,848	1,733	2,749	3,507	1,943	1,461
17,000 AF WA	1,359	2,224	1,804	1,780	2,362	2,202	1,837	1,715	2,700	3,528	1,852	1,433
Difference	-11.2	-10.6	4.4	13.9	-8.6	-29.2	-10.9	-18.7	-48.6	20.9	-91.5	-27.9
Percent Difference	-0.8	-0.5	0.2	0.8	-0.4	-1.3	-0.6	-1.1	-1.8	0.6	-4.7	-1.9
Critical												
No Action Alternative	1,313	2,149	1,639	1,416	1,346	989	1,201	1,100	1,536	2,088	969	896
17,000 AF WA	1,302	2,054	1,630	1,405	1,314	985	1,179	1,075	1,512	1,779	1,327	894
Difference	-11.4	-95.1	-8.6	-10.3	-32.0	-4.1	-22.1	-24.8	-23.4	-308.5	357.9	-2.1
Percent Difference	-0.9	-4.4	-0.5	-0.7	-2.4	-0.4	-1.8	-2.3	-1.5	-14.8	36.9	-0.2

[1] Based on the 82-year simulation period
[2] As defined by the Sacramento Valley 40-30-30 Index Water Year Hydrologic Classification (SWRCB, 1995)

Table A-6 Long-term Average Water Temperatures and Average Water Temperatures by Water Year Type in the Lower American River at Watt Avenue under the 17,000 AF WA and No Action Alternative Conditions

Analysis Period	Average Temperature (ºF)											
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Long-term Full Simulation Period[1]												
No Action Alternative	60.1	56.1	49.6	46.4	47.8	52.1	56.8	60.9	64.3	66.5	67.0	66.6
17,000 AF WA	60.1	56.1	49.5	46.4	47.9	52.1	56.8	60.9	64.4	66.5	66.9	66.6
Difference	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0
Water Year Types[2]												
Wet												
No Action Alternative	59.5	56.0	49.9	46.5	47.4	51.0	55.0	58.8	62.6	66.3	66.5	66.3
17,000 AF WA	59.5	56.0	49.9	46.5	47.4	51.0	55.0	58.8	62.6	66.3	66.5	66.3
Difference	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Above Normal												
No Action Alternative	60.6	56.1	50.0	46.9	47.7	51.3	56.3	60.3	64.2	65.7	65.6	65.4
17,000 AF WA	60.5	56.0	49.9	46.9	47.7	51.3	56.4	60.3	64.2	65.7	65.6	65.3
Difference	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	-0.1
Below Normal												
No Action Alternative	59.5	55.7	49.1	45.9	47.0	52.1	56.5	60.3	63.7	65.8	65.9	65.7
17,000 AF WA	59.6	55.7	49.1	45.9	47.0	52.1	56.5	60.3	63.8	65.8	65.8	65.7
Difference	0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	-0.1	0.0
Dry												
No Action Alternative	60.	56.0	49.4	46.2	48.0	52.7	58.1	62.	65.	66.	67.	66.

Analysis Period	Average Temperature (ºF)											
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	2							8	6	1	0	9
17,000 AF WA	60.1	56.0	49.4	46.2	48.0	52.7	58.1	62.8	65.7	66.0	67.1	67.0
Difference	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	-0.1	0.1	0.1
Critical												
No Action Alternative	61.9	56.7	49.2	46.6	49.8	54.3	59.3	63.6	67.1	69.2	70.5	69.1
17,000 AF WA	61.8	56.7	49.2	46.5	49.8	54.3	59.4	63.7	67.0	69.4	69.9	69.2
Difference	-0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	-0.2	0.2	-0.5	0.0

[1] Based on the 81-year simulation period
[2] As defined by the Sacramento Valley 40-30-30 Index Water Year Hydrologic Classification (SWRCB, 1995)

Table A-7 Difference in Number of Occurrences of Water Temperature Changes Relative to Index Values by Month, Water Year Type, and Life Stages in the Lower American River at Watt Avenue under the 17,000 AF WA vs. No Action Alternative Conditions

Species/Life Stage	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Fall-run Chinook Salmon - Adult Immigration and Holding												
60°F			--	--	--	--	--	--	--	--	--	
64°F			--	--	--	--	--	--	--	--	--	
68°F			--	--	--	--	--	--	--	--	--	
Fall-run Chinook Salmon - Adult Spawning and Incubation												
56°F		-1(B)				--	--	--	--	--	--	--
58°F	1(B) -1(C)					--	--	--	--	--	--	--
60°F						--	--	--	--	--	--	--
62°F	-1(A)					--	--	--	--	--	--	--
Fall-run Chinook Salmon - Juvenile Rearing and Downstream Movement												
60°F	--	--								--	--	--
63°F	--	--								--	--	--
65°F	--	--							1(D) -1(C)	--	--	--
68°F	--	--								--	--	--
70°F	--	--								--	--	--
75°F	--	--								--	--	--
Steelhead - Adult Immigration and Holding												
52°F	--						--	--	--	--	--	--
56°F	--	-1(B)					--	--	--	--	--	--
70°F	--						--	--	--	--	--	-

Species/Life Stage	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
												-
Steelhead - Adult Spawning and Incubation												
52°F	--	--						--	--	--	--	--
54°F	--	--						--	--	--	--	--
57°F	--	--						--	--	--	--	--
60°F	--	--						--	--	--	--	--
Steelhead - Fry & Fingerling Rearing and Downstream Movement												
65°F									1(D) -1(C)			
68°F										1(C)		
72°F											-1(C)	
75°F											-1(C)	
Steelhead - Smolt Emigration												
52°F	--	--	--							--	--	--
55°F	--	--	--							--	--	--
Striped Bass - Adult Spawning, Incubation & Initial Rearing												
59°F	--	--	--	--	--	--	--			--	--	--
68°F	--	--	--	--	--	--	--			--	--	--
American Shad - Adult Immigration & Spawning												
60°F	--	--	--	--	--	--	--			--	--	--
70°F	--	--	--	--	--	--	--			--	--	--

[1] Difference in water temperatures presented as a change from the No Action Alternative. Positive differences indicate additional occurrence(s) of water temperatures above the specified water temperature index value, and negative differences indicate fewer occurrence(s) of water temperatures above the specified water temperature index value.

[2] Modeled water temperature changes of greater than 0.3˚F are considered to represent measurable changes.

[3] As defined by the Sacramento Valley 40-30-30 Index Water Year Hydrologic Classification (SWRCB, 1995) W=Wet; A=Above Normal; B=Below Normal; D=Dry; C=Critical (40-30-30 Water Year Types); shading indicates life stage periodicity.

Appendix B: Cultural Resources

Compliance Memo

Appendix C: Indian Trust Assets

Compliance Memo

Appendix D: Potential Effect of Diversions on Folsom Reservoir Cold Water Pool

Potential Effect of Diversions on Folsom Reservoir Cold Water Pool

El Dorado Irrigation District Folsom Reservoir Water Supply Intake

March 3, 2011

Prepared by: ***Daniel Kramer***

1.0 Introduction

The U.S. Bureau of Reclamation (Reclamation) proposes to enter into a 40-year Warren Act Contract with the El Dorado Irrigation District (EID) to convey up to 17,000 acre-feet per year (afy) of non-Project water (i.e., water not part of the Central Valley Project [CVP]) through Folsom Reservoir for municipal and industrial (M&I) uses in the western portion of El Dorado County. This supply is available to EID through State Water Resources Control Board Permit 21112. **Table 1** lists the timing and magnitude of these proposed diversions as allowed under this permit.

Table 1. Year 2001-22 El Dorado Hills Service Area Diversion Patterns (AF)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Permit 21112 Diversion Pattern[1]	694	575	609	914	1,793	2,470	2,774	2,672	1,810	1,184	778	727	17,000
Permit 21112 Diversion Pattern 50%	347	288	304	457	897	1,235	1,387	1,336	905	592	389	364	8,500
Permit 21112 Diversion Pattern 30%	208	173	183	274	538	741	832	802	543	355	233	218	5,100

1. As provided in Tables 1-3 of State of California State Water Resources Control Board Order WR 2001-22, adjusted for full supply amount.

Seasonal releases from Folsom Reservoir are managed, to the extent possible, to provide suitable thermal conditions in the lower American River for both fall-run Chinook salmon and Central Valley steelhead. Depending on conditions in any one year (carryover storage, inflow, Project demands, reservoir stratification, etc.) and reservoir outlet configuration, Folsom Reservoir's coldwater pool is not always large enough to maintain coldwater releases during both (or either) the warmest months (July through September) to provide maximum thermal benefits to rearing juvenile steelhead, and/or during October and November to benefit fall-run Chinook salmon immigration, spawning, and embryo incubation. Consequently, lower American River temperature management is annually prescribed based on current conditions in an attempt to provide thermal benefits to both fall-run Chinook salmon and steelhead, within the constraints of coldwater pool availability.

This memorandum documents the analysis undertaken to evaluate potential effects of conveying up to 17,000 acre-feet per year (afy) of non-Project water on the ability to manage the Cold Water Pool (CWP) in Folsom Reservoir for the benefit of aquatic resources in the American River below Nimbus Dam.

2.0 Folsom Reservoir Temperature Regime and Cold Water Pool Management

2.1 Overview of Folsom Reservoir Temperature Operation

Folsom Reservoir fills during the spring and early summer with snowmelt runoff from the upper American River basin. Early in this period, the reservoir is well mixed with a fairly uniform water temperature profile from top to bottom. However, as the runoff decreases and the surface temperature of

the reservoir increases, the reservoir stratifies with warmer water near the surface and colder water on the bottom. **Figure 1** illustrates this progression of stratification through the year using temperature profile data from 2006.

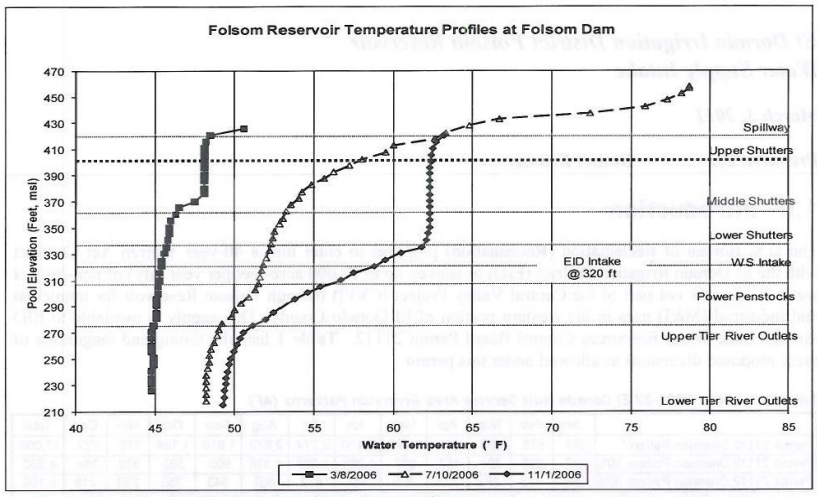

Figure 1. Folsom Reservoir Water Temperature Profiles

Figure 1 also identifies the various Folsom Reservoir elevations from which releases can be made. The power penstocks at Folsom Reservoir, the main release points from the reservoir, are fitted with a shutter system that can selectively withdraw water at multiple elevations, thereby adjusting the water temperature of the release. Management of the Folsom Reservoir CWP involves positioning the shutters to obtain a release temperature that is cold enough to meet the desired temperature for present downstream aquatic resources needs but high enough to preserve the CWP to meet temperature requirements later in the year. With the shutters fully withdrawn, the release is directly through the penstocks at a centerline elevation of 307 feet. As long as the CWP is above this elevation, the shutters can be adjusted to facilitate releases at temperatures necessary to meet downstream water temperature targets and avoid downstream temperature or power generation impacts.

Once the CWP cannot be accessed through the power outlets, the Folsom Dam upper and/or lower river outlets can be used for release temperature management. These outlets are used only when absolutely necessary, as water released through the river outlets bypasses the Folsom Power Plant and results in reduced generation. The upper and lower river outlets are at centerline elevations of 278 and 208 feet, respectively.

2.2 Downstream Water Temperature Requirements

Water temperature requirements for the lower American River are specific to the life stage of the species present in the river. For long-term modeling purposes, a set of monthly temperature targets for the lower American River at Watt Avenue has been developed for use in the Automated Temperature Selection Procedure (ATSP). The ATSP is a management tool using temperature models of the Folsom Reservoir

and the Lower American River to simulate the "best" use of the Folsom Reservoir CWP for downstream aquatic species for a given set of hydrologic conditions. **Table 2** lists these temperature targets.

Table 2. "Optimal" Temperature Targets in Lower American River at Watt Avenue from ATSP (° F)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
N/A	N/A	N/A	N/A	64	64	64	64	64	57	56	N/A

Reclamation operates Folsom Dam and Nimbus Dam to maintain daily average water temperatures as close as possible to the Table 2 temperatures for the LAR at Watt Avenue from June 1 through October 15 for juvenile steelhead over-summer rearing. Temperature targets that address fall–run Chinook spawning and incubation start in late October or early November (October 16-November 30 timeframe). Reclamation works to provide suitable temperatures as early as possible, after November 1, to help avoid temperature related pre-spawning mortality of adults and reduced egg viability. Typically, the ambient air temperature controls the LAR temperatures in mid-to late-November when decreased air temperatures limit the in-river heating.

There are no temperature targets identified in the December through April period because the low temperature of Folsom Reservoir releases and the lack of in-river heating (during this period cooling may occur as the water moves downstream) of the water in the Lower American River are sufficiently cool to meet the requirements of all species life stages.

Because these target temperatures are at Watt Avenue, the Folsom Reservoir release temperature needs to be colder to compensate for heating that occurs as the water travels downstream to Watt Avenue. For this analysis, the CWP is assumed to consist of all water in Folsom Reservoir at or below 60°F, as suggested by the Bureau of Reclamation (Reclamation) (email comments from Jeff Sandberg, 8/28/2007). This value will give a conservative estimate of the CWP available in Folsom Reservoir that could be used for the benefit of the downstream aquatic resources.

3.0 Analysis Procedure

If the project reduces the CWP to the point where Reclamation cannot meet the preferred Watt Avenue temperature targets, downstream aquatic resources could potentially be impacted. This effect is most likely to occur near the end of October when the CWP is at a relatively low level and the downstream temperature requirements become lower, and require a lower release temperature.

In order to evaluate the potential for the project to cause an impact, this analysis estimated changes in the volume of water below 60°F in the Folsom Reservoir CWP attributed to the proposed diversion. This volume was then used to estimate a new water temperature at the centerline of the penstocks and as an indicator of the potential effect on river outlet use at the end of October. A second analysis estimated an equivalent number of days release for the volume change to the CWP as an indicator of potential impact related to foregone generation.

3.1 Folsom Reservoir Temperature Profile Data

The analysis is based on water temperature profile data furnished by Reclamation at six locations in Folsom Reservoir. These locations are:

- Site A 38°47.0107' N; 121°06.3991' W (North Fork arm near Anderson Creek)
- Site B 38°44.1948' N; 121°05.6332' W (Red Buoy in front of EID's intake, South Fork arm)
- Site C 38°44.0027' N; 121°08.6959' W (North Fork arm off Mooney Ridge)
- Site D 38°42.7674' N; 121°07.3176' W (South Fork arm off Mormon Island Dam)

- Site E 38°46.0292' N; 121°07.3141' W (North Fork arm)
- Site Dam 38°42.5401' N; 121°09.3220' W (White buoy in front of dam)

The profiles were taken at irregular intervals of approximately 3-5 weeks from 2002 through 2010. Location B was assumed to represent the temperature profile at the EID water supply intake. Site D located at the South Fork arm off Mormon Island Dam was used when no data was available at Site B. All profiles from each year were selected for use in the analysis. **Figure 2** shows an example of the fall reservoir condition profiles used in the analysis.

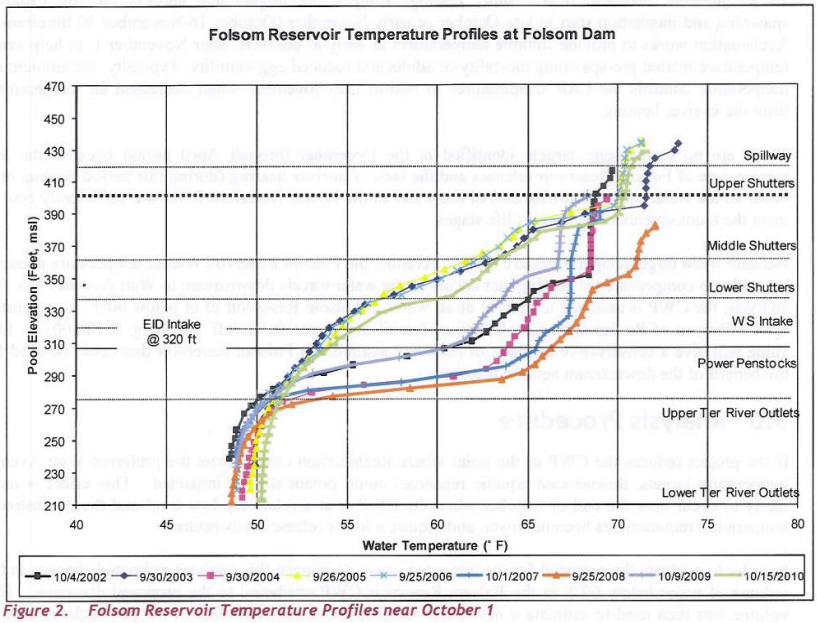

Figure 2. Folsom Reservoir Temperature Profiles near October 1

As can be seen in Figure 2, the profiles for 2003, 2005, 2006, and 2010 have about the same top of CWP elevation. In these years the CWP appears to be sufficient to allow release through the penstocks and still meet the downstream temperature requirements. In 2002 and 2009 the top of the CWP is near the penstock elevation and it appears that the CWP accessible through the penstocks may have been depleted. Historically, a release was made through the river outlets in 2002 to improve temperature conditions in the Lower American River. In 2004, 2007, and 2008 the top of the CWP is below the penstock elevation but is above the upper River outlet. Releases from the River outlet were not made in 2004 due to low ambient temperatures producing lower than expected temperatures in the Lower American River. Releases of between 300 and 700 cfs were made from the river outlets in November 2007, 2008, 2009, and 2010.

3.2 Potential Inflow Change Effects on the CWP

The project will involve rediverting supply from Kyburz Diversion Dam and El Dorado Powerhouse and allowing the water to flow downstream into Folsom Reservoir and then be diverted at the existing EID water supply intake. These operations affect temperatures in Folsom Reservoir by increasing the volume of cold water inflow available to develop and sustain the CWP that would not be available if such supplies were utilized at their original diversion locations due to increased flow in the upstream reaches of the South Fork.

3.2.1 Increased Inflow Volume and Potential Contribution to the Folsom Reservoir CWP

Foregoing upstream diversions increase the inflow to Folsom Reservoir by the volume of the upstream diversion. Any of this water below 60°F contributes to the CWP in Folsom Reservoir. The USGS Gage 11446030, South Fork American River at Pilot Hill, includes water temperature data from August 1999 to the present. The Folsom inflow increase due to this project occurs during the period March 1 to October 31. **Figure 3** shows the temperature at the gage for these months for the 2002 – 2010 period of analysis.

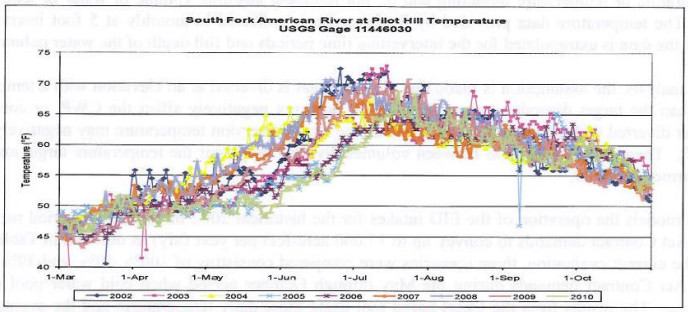

Figure 3. South Fork American River Inflow to Folsom Reservoir Temperature

The effect of this inflow on the CWP was estimated by adding up the additional inflow volume for each day during the analysis period that the temperature was less than 60°F to get a monthly total increase to the CWP. Since the computation only considers if the temperature is above or below 60°F, and not the actual temperature, missing data was filled in by assuming that if the temperatures of the days bordering the missing data was below 60°F, the missing data would also be below 60°F. The results of this computation are shown in **Table 3**.

Table 3. Additional South Fork American River Inflow to Folsom Reservoir Below 60°F (AF)

	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Total
2002	609	914	1793	576	0	86	1568	1184	6730
2003	609	914	1793	1235	0	0	60	879	5489
2004	609	914	1099	329	0	690	1749	840	6229
2009	609	914	1793	2223	0	172	603	1184	7498
2006	609	914	1793	2058	0	0	181	1146	6701
2007	609	914	1735	82	0	690	844	1184	6058
2008	609	914	1388	0	0	0	294	248	3452
2009	609	914	1817	1070	0	172	1206	1184	6973
2010	609	914	1875	2470	269	86	1508	1031	8761

3.2.2 Reduced Inflow Temperature

The increased stream flow into Folsom Reservoir caused by rediverting the water at Folsom Reservoir may impact the water temperature gain, thereby changing the temperature of the water entering Folsom Reservoir. This effect would be very difficult to evaluate due to the dearth of data for existing flows and temperatures in the affected stream reaches. Because this effect is expected to be small, and extremely difficult to evaluate, it was not considered for this analysis.

3.3 Potential Diversion Change Effects

According to EID, the current water supply intakes withdraw water from Folsom Reservoir at an elevation of 320 feet. The volume and temperature of the water at this level was estimated using an Excel-based tool that represents a comparative assessment for evaluation of intake scenarios based on interpolation of temperature and diversion data from Reclamation and EID. Intake elevations and temperature target of 60°F were parameters specified in the tool. However, the numbers are not derived from hydraulic or temperature modeling and do not represent absolute volume of water or temperature results. The temperature data provided by Reclamation is collected bi-monthly at 5 foot intervals and therefore the data is extrapolated for the intervening time periods and full depth of the water column.

For this analysis, the assumption is made that all water that is diverted at an elevation with a temperature greater than the target diversion temperature (60°F) does not negatively affect the CWP, or conversely that water diverted with a temperature of less than the target diversion temperature may negatively affect the CWP. There is differentiation between volumes diverted very near the temperature target and those much warmer or cooler.

The tool models the operation of the EID intakes for the historical 2002 through 2010 period using EID Warren Act Contract demands to convey up to 17,000 acre-feet per year (afy) as outlined in Table 1. As part of the current evaluation, three scenarios were compared consisting of 100%, 50%, and 30% of EID Warren Act Contract demands during the May through October period when cold water pool impacts could occur. The results from the Excel-based tool using these daily temperatures and the average daily diversion were used to compute the total monthly volume of diversion of water less than 60°F assuming the full diversion was made. **Table 4a-c** shows the results of this process.

Table 4a. Estimated Diversion Below 60°F (AF); 100%

	May	Jun	Jul	Aug	Sep	Oct	Total
2002	1,793	2,470	2,774	2,672	664	0	10,373
2003	1,793	2,470	2,774	2,672	1,810	1,184	12,703
2004	1,793	2,470	2,774	1,207	0	0	8,244
2005	1,793	2,470	2,774	2,672	1,810	1,184	12,703
2006	1,793	2,470	2,774	2,672	1,810	1,184	12,703
2007	1,793	2,470	2,774	2,500	0	0	9,537
2008	1,793	2,470	2,774	172	0	0	7,209
2009	1,793	2,470	2,774	2,672	1,026	0	10,735
2010	1,793	2,470	2,774	2,672	1,810	1,184	12,703

Table 4b. Estimated Diversion Below 60°F (AF); 50%

	May	Jun	Jul	Aug	Sep	Oct	Total
2002	897	1,235	1,387	1,336	332	0	5,186
2003	897	1,235	1,387	1,336	905	592	6,352
2004	897	1,235	1,387	603	0	0	4,122
2005	897	1,235	1,387	1,336	905	592	6,352
2006	897	1,235	1,387	1,336	905	592	6,352
2007	897	1,235	1,387	1,250	0	0	4,768
2008	897	1,235	1,387	86	0	0	3,605
2009	897	1,235	1,387	1,336	513	0	5,367
2010	897	1,235	1,387	1,336	905	592	6,352

Table 4c. Estimated Diversion Below 60°F (AF); 30%

	May	Jun	Jul	Aug	Sep	Oct	Total
2002	538	741	832	802	199	0	3,112
2003	538	741	832	802	543	355	3,811
2004	538	741	832	362	0	0	2,473
2005	538	741	832	802	543	355	3,811
2006	538	741	832	802	543	355	3,811
2007	538	741	832	750	0	0	2,861
2008	538	741	832	52	0	0	2,163
2009	538	741	832	802	308	0	3,220
2010	538	741	832	802	543	355	3,811

3.4 Potential Effects to Folsom CWP

As discussed in Section 3.2.1, the project will result in inflow to Folsom Reservoir, some of which will be below 60ºF and a net increase to the CWP. Also, as discussed in Section 3.3, the project will result in increased diversion at the EID water supply intake, some of which will be below 60ºF and can be assumed to decrease the CWP. The potential impact to the Folsom CWP is the net impact of the project is the difference between these two values in each month during the May through October time period. This net was calculated by subtracting the increase in the CWP, summarized in Table 3 from the reduction in CWP, summarized in Table 4. Without the project, CWP volumes as of November 1 each year at or below the 60ºF CWP limit were estimated from the Folsom temperature profiles. The total estimated CWP change from the project was then added to these values to estimate the CWP volumes with the project. The results of this computation are summarized in **Table 5 a-c**.

Table 5a. Net Change in Folsom Reservoir Cold Water Pool Volume (AF), 100% Diversion

Date	Nov 1rst Elev <60 ºF (ft msl)	Nov 1rst <60 ºF Storage (af)	Diversion May-Nov 1rst <60 ºF (af)	Adjusted Inflow <60 ºF Mar-Nov 1rst (af)	Modified <60 ºF Storage (af)	Net Change in CWP Volume (af)
11/1/2002	305.4	48,249	10,373	6,730	44,606	-3,643
11/4/2003	330.6	90,342	12,703	5,489	83,128	-7,214
10/28/2004	308.3	52,178	8,244	6,229	50,163	-2,015
10/31/2005	335.8	101,799	12,703	7,498	96,594	-5,205
11/1/2006	330.5	90,133	12,703	6,701	84,130	-6,003
10/31/2007	302.6	44,645	9,537	6,058	41,166	-3,479
10/27/2008	298.6	39,821	7,209	3,452	36,064	-3,757
10/22/2009	312.2	57,786	10,735	6,973	54,024	-3,762
10/29/2010	341.7	116,285	12,703	8,761	112,343	-3,942

Table 5b. Net Change in Folsom Reservoir Cold Water Pool Volume (AF), 50% Diversion

Date	Nov 1rst Elev <60 ºF (ft msl)	Nov 1rst <60 ºF Storage (af)	Diversion May-Nov 1rst <60 ºF (af)	Adjusted Inflow <60 ºF Mar-Nov 1rst (af)	Modified <60 ºF Storage (af)	Change in CWP Volume (af)
11/1/2002	305.4	48,249	5,186	6,730	49,792	1,543
11/4/2003	330.6	90,342	6,352	5,489	89,480	-862
10/28/2004	308.3	52,178	4,122	6,229	54,285	2,107
10/31/2005	335.8	101,799	6,352	7,498	102,945	1,146
11/1/2006	330.5	90,133	6,352	6,701	90,482	349
10/31/2007	302.6	44,645	4,768	6,058	45,934	1,289
10/27/2008	298.6	39,821	3,605	3,452	39,668	-153
10/22/2009	312.2	57,786	5,367	6,973	59,391	1,605
10/29/2010	341.7	116,285	6,352	8,761	118,695	2,410

Table 5c. Net Change in Folsom Reservoir Cold Water Pool Volume (AF), 30% Diversion

Date	Nov 1rst Elev <60 ºF (ft msl)	Nov 1rst <60 ºF Storage (af)	Diversion May-Nov 1rst <60 ºF (af)	Adjusted Inflow <60 ºF Mar-Nov 1rst (af)	Modified <60 ºF Storage (af)	Net Change in CWP Volume (af)
11/1/2002	305.4	48,249	3,112	6,730	51,867	3,618
11/4/2003	330.6	90,342	3,811	5,489	92,020	1,678
10/28/2004	308.3	52,178	2,473	6,229	55,934	3,756
10/31/2005	335.8	101,799	3,811	7,498	105,486	3,687
11/1/2006	330.5	90,133	3,811	6,701	93,023	2,890
10/31/2007	302.6	44,645	2,861	6,058	47,842	3,197
10/27/2008	298.6	39,821	2,163	3,452	41,110	1,289
10/22/2009	312.2	57,786	3,220	6,973	61,538	3,752
10/29/2010	341.7	116,285	3,811	8,761	121,235	4,950

3.5 Potential Impacts on Penstock Release Temperatures

The reduced volume in the CWP would potentially increase the temperature at any given elevation in the reservoir above the original 60°F elevation. After the water is removed from the reservoir the warmer water from above would be at a lower elevation but would have the same temperature. **Table 6a-c** summarizes the results of this process for each year of the analysis. For this analysis, the change in temperature at the centerline of the penstocks was estimated by:

- Assume the full change in the CWP occurred below the centerline of the penstock. This will give the maximum change in temperature at the lowest penstock elevation. (Note that in 2003, 2004, 2005, 2006, 2009, and 2010 the non-project centerline penstock temperature was below the 60°F CWP limit. Since the change in CWP volume includes all water less than 60°F, some portion of the volume would be above the penstock centerline and would not impact the temperature at the centerline. This implies that the temperature change computed in these years is somewhat higher than would actually be expected, giving a conservative estimate of the temperature impact.)
- Estimate the temperature at the centerline of the penstock elevation (307 feet) from the reservoir temperature profile.
- Compute a "modified" storage as the sum of the storage at the centerline of the penstocks plus the net CWP volume removed by the project.

- Get the "modified" elevation that corresponds to this new storage from the Folsom elevation-storage curve.
- Estimate the "modified" temperature at the "modified" elevation from the reservoir temperature profile. This represents the temperature of the water that would be at the elevation of the centerline of the penstocks with the project in place.

Table 6a. Estimated Temperature Change at Centerline of Penstock, November 1rst ; 100% Diversion

	Original			Modified					
Profile Date	Temp at Penstock (307 ft) (ºF)	Elev <60 ºF (ft msl)	<60 ºF Storage (af)	<60 ºF Storage (af)	<60 ºF Elevation (ft msl)	Adjustment to Elevation at Power Penstock (feet)	Elevation at Power Penstock (ft msl)	Temp at Penstock (ºF)	Change (ºF)
11/1/2002	60.4	305.4	48,249	44,606	302.6	2.8	309.8	61.0	0.6
11/4/2003	57.0	330.6	90,342	83,128	327.0	3.6	310.6	57.4	0.4
10/28/2004	59.6	308.3	52,178	50,163	306.8	1.5	308.5	60.0	0.4
10/31/2005	56.1	335.8	101,799	96,594	333.5	2.3	309.3	56.5	0.4
11/1/2006	57.8	330.5	90,133	84,130	327.6	2.9	309.9	58.2	0.4
10/31/2007	60.9	302.6	44,645	41,166	299.7	2.9	309.9	61.2	0.3
10/27/2008	62.0	298.6	39,821	36,064	295.2	3.4	310.4	62.1	0.1
10/22/2009	59.6	312.2	57,786	54,024	309.6	2.6	309.6	59.7	0.1
10/29/2010	55.0	341.7	116,285	112,343	340.2	1.5	308.5	55.3	0.3

Table 6b. Estimated Temperature Change at Centerline of Penstock, November 1rst; 50% Diversion

	Original			Modified					
Profile Date	Temp at Penstock (307 ft) (ºF)	Elev <60 ºF (ft msl)	<60 ºF Storage (af)	<60 ºF Storage (af)	<60 ºF Elevation (ft msl)	Adjustment to Elevation at Power Penstock (feet)	Elevation at Power Penstock (ft msl)	Temp at Penstock (ºF)	Change (ºF)
11/1/2002	60.4	305.4	48,249	49,792	306.5	(1.1)	305.9	60.2	(0.2)
11/4/2003	57.0	330.6	90,342	89,480	330.2	0.4	307.4	57.0	0.0
10/28/2004	59.6	308.3	52,178	54,285	309.8	(1.5)	305.5	59.3	(0.3)
10/31/2005	56.1	335.8	101,799	102,945	336.3	(0.5)	306.5	55.6	(0.5)
11/1/2006	57.8	330.5	90,133	90,482	330.7	(0.2)	306.8	57.8	0.0
10/31/2007	60.9	302.6	44,645	45,934	303.6	(1.0)	306.0	60.8	(0.1)
10/27/2008	62.0	298.6	39,821	39,668	298.5	0.1	307.1	62.0	0.0
10/22/2009	59.6	312.2	57,786	59,391	313.2	(1.0)	306.0	59.5	(0.1)
10/29/2010	55.0	341.7	116,285	118,695	342.6	(0.9)	306.1	54.8	(0.2)

Table 6c. Estimated Temperature Change at Centerline of Penstock, November 1rst; 30% Diversion

	Original			Modified					
Profile Date	Temp at Penstock (307 ft) (ºF)	Elev <60 ºF (ft msl)	<60 ºF Storage (af)	<60 ºF Storage (af)	<60 ºF Elevation (ft msl)	Adjustment to Elevation at Power Penstock (feet)	Elevation at Power Penstock (ft msl)	Temp at Penstock (ºF)	Change (ºF)
11/1/2002	60.4	305.4	48,249	51,867	308.1	(2.7)	304.3	59.6	(0.8)
11/4/2003	57.0	330.6	90,342	92,020	331.4	(0.8)	306.2	56.9	(0.1)
10/28/2004	59.6	308.3	52,178	55,934	311.9	(3.6)	303.4	58.9	(0.7)
10/31/2005	56.1	335.8	101,799	105,486	337.4	(1.6)	305.4	55.9	(0.2)
11/1/2006	57.8	330.5	90,133	93,023	331.9	(1.4)	305.6	57.6	(0.2)
10/31/2007	60.9	302.6	44,645	47,842	305.2	(2.6)	304.4	60.5	(0.4)
10/27/2008	62.0	298.6	39,821	41,110	299.7	(1.1)	305.9	62.0	0.0
10/22/2009	59.6	312.2	57,786	61,538	314.7	(2.5)	304.5	59.5	(0.1)
10/29/2010	55.0	341.7	116,285	121,235	343.6	(1.9)	305.1	54.7	(0.3)

Reclamation has suggested that the number of days of release impacted by any change in the CWP is an appropriate method to evaluate potential impacts to CWP operations. **Table 7** summarizes the number of days of release at 1500 cfs (typical fall release schedule from Folsom Reservoir) represented by each of the computed change in CWP.

Table 7. CWP Volume Change and Days Release at 1500 cfs

	30% Diversion		50% Diversion		100% Diversion	
Year	CWP Decrease (af)	Equivalent Days	CWP Decrease (af)	Equivalent Days	CWP Decrease (af)	Equivalent Days
2002	-3,618	(1.2)	-1,543	(0.5)	3,643	1.2
2003	-1,678	(0.6)	862	0.3	7,214	2.4
2004	-3,756	(1.3)	-2,107	(0.7)	2,015	0.7
2005	-3,687	(1.2)	-1,146	(0.4)	5,205	1.7
2006	-2,890	(1.0)	-349	(0.1)	6,003	2.0
2007	-3,197	(1.1)	-1,289	(0.4)	3,479	1.2
2008	-1,289	(0.4)	153	0.1	3,757	1.3
2009	-3,752	(1.3)	-1,605	(0.5)	3,762	1.3
2010	-4,950	(1.7)	-2,410	(0.8)	3,942	1.3

4.0 Conclusions

In traditional Folsom Reservoir and Lower American River temperature modeling, any temperature change of less than 0.3°F is assumed to be undetectable as it is less than the lower limit of accuracy of temperature measurement. This would imply that in four of the ten years (2007, 2008, 2009, and 2010) the full Permit 21112 diversion would not be detectable using this parameter, compared to historic conditions. During low water years, such as 2007 and 2008, when the CWP is below the power penstock elevation, the temperature profiles are such that the diversion does not affect the temperature at the penstock. During these conditions, Reclamation would already be challenged in meeting river temperatures and would be evaluating use of other outlet scenarios. During high water years, such as 2009 and 2010, the temperature at the penstock remains at or below 60 °F.

For the full Permit 21112 diversion, the change is greater than 0.3 °F for three years (2003, 2005, and 2006), however, the temperature at the penstock remains at or below 60 °F, and therefore the change in lowest possible release temperature through the penstocks due to this project, would not be detectable and therefore would not trigger any change in Folsom Reservoir CWP operations. For two years (2002 and 2004), the top of the cold water pool is located near the penstock intakes and the full Permit 21112 diversion would potentially be detectable, compared to historic conditions.

Based on the results of the 50% Permit 21112 diversions, and the adjusted inflow less than 60 °F, the estimated temperature increases are less than 0.3°F. Based on the results of the 30% Permit 21112 diversions, the estimated temperature increases are also less than 0.3°F.

Reclamation has suggested that any change in CWP volume equivalent to 4 days release at 1500 cfs has the potential to be a significant impact (email comments from Jeff Sandberg of Reclamation 8/28/2007). As shown in **Table 7**, the equivalent number of days release using the 100% Permit 21112 diversions, varies from 0.7 to 2.4 days. Even if the full additional diversion of AF reduced the CWP, this would represent a maximum of 2.4 days release, below the 4 days suggested to have the potential for a significant impact. The equivalent number of days release using the 30% and 50% Permit 21112

diversions, varies from 0 to 0.3 days, far below the 4 days suggested to have the potential for a significant impact.

The proposed project impacts have the potential to change in the future if American River demands or operations (Flow Management Study, Folsom Reoperation) change and cause a decrease in the Folsom CWP. The likelihood of this happening is relatively small as any changes in Folsom diversions or operations will include consideration to minimize temperature impacts. In any case, the maximum volume reduction in CWP and equivalent days release would remain similar to the evaluated historic conditions. Therefore, the ability to manage the Folsom Reservoir CWP for the benefit of the downstream aquatic resources does not appear to be significantly affected by the proposed project.

APPENDIX E: DRAFT CONTRACT FOR CONVEYANCE OF NON-PROJECT WATER BETWEEN THE UNITED STATES AND THE EL DORADO IRRIGATION DISTRICT

CCAO Draft 11-20-2014
CCAO Draft 11-19-2014
CCAO Draft 11-14-2014
CCAO Draft 11-12-2014
CCAO Draft 10-03-2014
Permit 21112/Project 184

Temporary Warren Act Contract
M&I Only

Contract No. 15-WC-20-4654

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
American River Division, Central Valley Project, California

CONTRACT FOR CONVEYANCE OF NON-PROJECT WATER BETWEEN THE UNITED STATES AND EL DORADO IRRIGATION DISTRICT

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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
American River Division, Central Valley Project, California

CONTRACT FOR CONVEYANCE OF NON-PROJECT WATER
BETWEEN THE UNITED STATES
AND
EL DORADO IRRIGATION DISTRICT

THIS CONTRACT, made this _____ day of _____, 2014, pursuant to the Act of June 17, 1902 (32 Stat. 388), and acts amendatory thereof or supplementary thereto, including the Act of February 21, 1911 (36 Stat. 925), and Section 305 of the Reclamation States Emergency Drought Relief Act of 1991, enacted March 5, 1992 (106 Stat. 59), all collectively hereinafter referred to as the Federal Reclamation laws, between the UNITED STATES OF AMERICA, hereinafter referred to as the United States, represented by the officer executing this Contract, hereinafter referred to as the Contracting Officer, and ELDORADO IRRIGATION DISTRICT, hereinafter referred to as the Contractor;

WITNESSETH, That:

EXPLANATORY RECITALS

[1] WHEREAS, the United States has constructed and is operating the Central Valley Project (Project), California, for diversion, storage, carriage, distribution and beneficial use, flood control, irrigation, municipal, domestic, industrial, fish and wildlife mitigation, protection and restoration, generation and distribution of electric energy, salinity control, navigation and

other beneficial uses, of waters of the Sacramento River, the American River, the Trinity River, and the San Joaquin River and their tributaries; and

[2] WHEREAS, the Contractor asserts a right to a Non-Project Water supply for municipal and industrial (M&I) purposes through its interest in direct diversion rights and rights for diversion for storage granted in Permit 21112 by the California State Water Resources Control Board and has requested the United States convey said Non-Project Water through Excess Capacity in Project Facilities; and

[3] WHEREAS, the United States is willing to convey said Non-Project Water to the Contractor through Excess Capacity in Project Facilities in accordance with the terms and conditions of this Contract; and

[4] WHEREAS, the Contractor and Contracting Officer recognize that this Contract does not grant any permission or entitlement to the Contractor to extract or divert from its sources the Non-Project Water supply conveyed pursuant to this Contract; and

[5] WHEREAS, the Contracting Officer and the Contractor entered into Cooperative Agreement No. 05FC201041for the design and construction of a Temperature Control Device (TCD) which expired December 31, 2012; and

[6] WHEREAS, the Contracting Officer and the Contractor acknowledge and agree that the Bureau of Reclamation and the Contractor have entered into Cooperative Agreement No. R14AC00061 (Cooperative Agreement) and that this Cooperative Agreement remains in full force and effect

as of the effective date of this Contract and is attached to this Contract as Exhibit D; and

[7] WHEREAS, although the Contractor asserts 17,000 acre-feet total rights per Year under Permit 21112, the Contracting Officer and the Contractor acknowledge and agree that no more than 8,500 acre-feet per Year will be diverted prior to the construction and operation of a TCD or equivalent from Contractor's Point of Delivery per Year under the Contract; and

[8] WHEREAS, the United States will consider, in good faith, the Contractor's requests to execute a new contract upon expiration of this Contract, to the extent that Excess Capacity in Project Facilities exists at the time of execution of a new contract, and to the extent that execution of a new contract would not contravene then-applicable law, including but not limited to the Act of February 21, 1911 (36 Stat. 925) and other Federal Reclamation laws.

NOW, THEREFORE, in consideration of the covenants herein contained, the parties hereto agree as follows:

DEFINITIONS

1. When used herein unless otherwise distinctly expressed, or manifestly incompatible with the intent of the parties as expressed in this Contract, the term:

(a) "Calendar Year" shall mean the period January 1 through December 31, both dates inclusive;

(b) "Contracting Officer" shall mean the Secretary of the Interior's (Secretary) duly authorized representative acting pursuant to this Contract or applicable Reclamation law or regulation;

(c) "Contractor's Boundaries" shall mean the geographic area within which the Contractor is authorized to serve Non-Project Water as set forth on Exhibit A, which may be modified in accordance with Article 24, without amendment of this Contract;

(d) "Contractor's Point of Delivery" shall mean the Folsom Lake Raw Water Pump Station on the south shore of the Folsom Reservoir or any replacement thereof, and/or any other additional point or points of delivery as may be mutually agreed to in writing by the Contracting Officer and the Contractor;

(e) "Excess Capacity" shall mean capacity in the Project Facilities in excess of that needed to meet the Project's authorized purposes, as determined solely by the Contracting Officer, which may be made available to convey and deliver Non-Project Water;

(f) "Irrigation Water" shall mean Non-Project Water that is used in the commercial production of agricultural crops or livestock, including domestic use incidental thereto. Irrigation Water shall not include water used for purposes such as the watering of landscaping or pasture for animals (e.g., horses) which are kept for personal enjoyment or water delivered to landholdings operated in units of less than 5 acres, unless the Contractor establishes to the satisfaction of the Contracting Officer that the use of water delivered to such

landholding is a use described in the first sentence of this subdivision of this Article 1;

(g) "Municipal and Industrial (M&I) Water" shall mean Non-Project Water, other than Irrigation Water, made available to the Contractor. M&I Water shall include water used for human use and purposes such as the watering of landscaping or pasture for animals (e.g., horses) which are kept for personal enjoyment or water delivered to land holdings operated in units of less than five acres unless the Contractor establishes to the satisfaction of the Contracting Officer that the use of water delivered to any such landholding is a use described in subdivision (f) of this Article 1;

(h) "Non-Project Water" shall mean water acquired by or available to the Contractor from the source(s) identified in Exhibit C that has not been appropriated or acquired by the United States;

(i) "Operation and Maintenance" or "O&M" shall mean normal and reasonable care, control, operation, repair, replacement (other than capital replacement), and maintenance of Project facilities;

(j) "Project" shall mean the Central Valley Project owned by the United States and operated by the Department of the Interior, Bureau of Reclamation;

(k) "Project Facilities" shall mean the Folsom Reservoir and associated facilities, constructed as features of the American River Division, Central Valley Project;

(l) "Project-Use Power" is that electrical energy, and its associated ancillary service components, required to provide the full electrical service needed to operate and maintain Project Facilities, and to provide electric service for Project purposes and loads in conformance with the Reclamation Project authorization. Project-Use Power is not available to pump Non-Project Water, to operate pumps that were not built as Federal facilities as part of the Project, to pump Project Water outside the authorized service area, or provide for on-farm uses;(l) "Project Water" shall mean all water that is developed, diverted, stored, or delivered by the United States in accordance with the statutes authorizing the Project and in accordance with the terms and conditions of applicable water rights permits and licenses acquired by and/or issued to the United States pursuant to California law;

(m) "Rates" shall mean the amount to be paid to the United States by the Contractor, as set forth in Exhibit B, for the use of Excess Capacity in the Project Facilities made available pursuant to this Contract;

(n) "RRA" shall mean the Reclamation Reform Act of October 12, 1982 (96 Stat. 1263), as amended;

(o) "Secretary" shall mean the Secretary of the Interior, a duly appointed successor, or an authorized representative acting pursuant to any authority of the Secretary and through any agency of the Department of the Interior; and

(p) "Water Service Contract" shall mean Contract No. 14-06-200-1357A-LTR1 between the United States and the Contractor, or in any amendment, extension, or renewal thereof, for a supply of Project Water;

(q) "Year" shall mean the period from and including March 1 of the Calendar Year through the last day of February of the following Calendar Year.

TERM OF CONTRACT

2. (a) This Contract shall become effective on March 1, 2015, and shall remain in effect through February 29, 2020, unless terminated by operation of law or by mutual agreement of the parties hereto: *Provided*, That upon 30 days' advance written notice to the Contractor, this Contract may also be terminated by the Contracting Officer at an earlier date, if the Contracting Officer determines that the Contractor has not been complying with one or more of the terms and conditions of this Contract unless the Contractor can show full compliance or a time schedule for compliance that is satisfactory to the Contracting Officer within the 30-day notice period.

(b) The Contractor shall promptly notify the Contracting Officer if and when the Contractor ceases to have any right to the use of the Non-Project Water being conveyed pursuant to this Contract.

INTRODUCTION, CONVEYANCE, AND DELIVERY OF NON-PROJECT WATER

3. (a) During the term of this Contract, the Contractor may introduce up to 8,500 acre-feet of Non-Project Water each Year into the Project

Facilities from the source(s) identified in Exhibit C. The quantity of Non-Project Water that will be conveyed to the Contractor will be the outflow of Non-Project Water from bypass flows at the Kyburz Diversion Dam and releases from the El Dorado Powerhouse, minus those conveyance losses identified in Exhibit C, and minus diversions of such water at El Dorado Forebay and Hazel Creek Tunnel. The United States shall convey said water to the Contractor's Point of Delivery through Excess Capacity in Project Facilities in accordance with a schedule as required in Article 4(a), or any revision or revisions thereof, submitted by the Contractor and approved by the Contracting Officer during the term hereof. If at any time the Contracting Officer determines that there will not be Excess Capacity in Project Facilities sufficient to receive, transport, and convey the Non-Project Water in accordance with the approved schedule, the Contracting Officer shall so notify the Contractor in writing. Within 24 hours of said notice, the Contractor shall revise its schedule accordingly.

(a.1) The Contractor, in order to minimize the impacts to CVP operations, will: (i) whenever possible, take delivery of Project Water pursuant to its Water Service Contract No. 14-06-200-1357A-LTR1 only to the extent that the Contractor's demands cannot be fully met using available Non-Project Water under this Contract or Contract No. 06-WC-20-3315, or other available water supplies under water rights held by the Contractor at Folsom Reservoir; and (ii) provide advance written notice to, and coordinate with, Reclamation regarding any proposed sales or transfers of Non-Project Water outside of the Contractor's Federal service area and obtain Reclamation's approval as necessary.

(b) The quantity(ies) of Non-Project Water conveyed to the Contractor through Project Facilities in any 30-day period shall not exceed the quantity of Non-Project Water previously introduced into the Project Facilities by the Contractor less the conveyance loss(es) identified in Exhibit C. The Contractor will be responsible to forgo diversions or to make releases under its state water rights, and any permits or approvals issued by the California State Water Resources Control Board relating to those rights, permits, or approvals, to divert the natural flow of the South Fork American River, its tributaries, and/or from the Contractor's upstream reservoirs the quantity of water that equals the quantity that the Contractor has scheduled to introduce into Folsom Reservoir, plus the amount(s) of conveyance loss(es) specified in Exhibit C.

(c) Exhibit C may be modified or replaced to reflect any changes to the source(s) of Non-Project Water or the quantity(ies) of conveyance loss(es), as determined by the Contracting Officer based on operational history, without amending this Contract. *Provided, however*, That no such modification or replacement shall be approved by the Contracting Officer absent the completion of all appropriate environmental documentation, including but not limited to documents prepared pursuant to the National Environmental Policy Act of 1969 (NEPA) and the Endangered Species Act of 1973 (ESA), as amended.

(d) All Non-Project Water conveyed and delivered to the Contractor pursuant to this Contract shall be used for M&I purposes only.

(e) Non-Project Water introduced into the Project Facilities shall be accounted for on a "first-in, first-out" basis. Non-Project Water that is

introduced into the Project Facilities by the Contractor and remains there for more than 30 days shall be deemed to be unused water available to the United States for Project purposes. Further, all Non-Project Water made available for delivery to the Contractor from the Project Facilities and not accepted by the Contractor shall be deemed to be unused water donated to the United States for Project purposes. Similarly, Non-Project Water that is introduced into the Project Facilities and remains there after the expiration of this Contract shall also be deemed unused water available to the United States for Project purposes.

(e.1) In the event it becomes necessary for the Contracting Officer to spill water from the Project Facilities for flood control or any other purpose, the quantity of water first spilled shall be deemed to be the Contractor's Non-Project Water to the extent that such water has been and/or is being introduced into the Project Facilities: *Provided*, That the Contracting Officer will to the extent possible inform the Contractor by written notice, or otherwise, of any spill from the Project Facilities: *Provided further*, That to the extent the Contractor has Non-Project Water being introduced into the Project Facilities after the Contractor has been informed of a pending spill, such water so introduced shall be delivered to the Contractor at the Contractor's request to the extent the United States is able to do so as conclusively determined by the Contracting Officer.

(f) The introduction, conveyance, and delivery of Non-Project Water pursuant to this Contract will not be supported with Project-Use Power. If electrical power is required to convey or pump the Non-Project Water into,

through or from the Project Facilities, the Contractor shall be responsible for the acquisition and payment of all electrical power and associated transmission service charges required to pump the Non-Project Water from the Contractor's Point of Delivery. Nothing within this Contract shall be construed to affect Contractor's eligibility to enter into future contracts for Western Area Power Authority power for purposes authorized by the then-current requirements for such power.

(f.1) The Contractor acknowledges and agrees that the re-diversion of up to 8,500 acre-feet of Non-Project Water each year, depending on annual needs of the Contractor, from Project Facilities may result in decreased power generation by Reclamation. The Contractor agrees to pay Reclamation for the foregone power resulting from the portion of Non-Project Water withdrawn from Folsom Reservoir that results in loss of power that would have otherwise been generated through Reclamation's power plant absent the Contractor's withdrawal of the Non-Project Water, following the process and schedule and using the formula provided in Exhibit G. The power costs associated with the re-diversion will be estimated and paid to Reclamation by May 15 of each Year in accordance with Exhibit G and be established by Letter of Agreement (LOA).

(f.2) The Contractor shall have no rights to any benefits from increased power generation that may result from the conveyance of the Non-Project Water through Excess Capacity in the Project Facilities authorized pursuant to this Contract.

(g) The Contractor shall utilize the Non-Project Water conveyed pursuant to this Contract in accordance with all requirements of any applicable biological opinion(s) in effect during the term of this Contract, including but not limited to all biological opinions for the joint operations of the Project and the State water projects.

(h) The introduction of Non-Project Water into the Project Facilities by the Contractor shall be conditioned upon compliance by the Contractor with the environmental measures described in the environmental documentation prepared in connection with the execution of this Contract and with the terms of the applicable operations procedures approved by the Contracting Officer.

(i) All Non-Project Water conveyed to the Contractor pursuant to this Contract shall be measured and recorded with equipment furnished, installed, operated, and maintained by the Contractor. Upon request by the Contracting Officer, the Contractor shall investigate the accuracy of such measurements and shall take all necessary steps to adjust any errors appearing therein. The Contractor has prepared in Exhibit E a gaging plan and schematic satisfactory to the Contracting Officer and Reclamation's Central Valley Operations Office (CVO) that contains specific requirements and procedures for water measurement and water accounting.

SCHEDULING AND REPORTING OBLIGATIONS OF THE CONTRACTOR

4. (a) On or before March 1 of each Calendar Year, or at such other times as the Contracting Officer determines to be necessary, the Contractor

shall submit to the Contracting Officer a written schedule, satisfactory to the Contracting Officer, showing the dates and estimated monthly quantities of all Project Water and Non-Project Water that the Contractor will divert from Project Facilities and conveyed by the United States to the Contractor for the upcoming Year under all contracts in force between Reclamation and the Contractor. During each month, the Contractor will revise said schedule to reflect; (i) the actual quantity(ies) of all Non-Project Water introduced into Project Facilities and conveyed by the United States to the Contractor; and (ii) the actual quantity(ies) of all Project Water delivered to the Contractor by Reclamation.

(b) For each month, by the 10th day of the succeeding month, the Contractor shall furnish a provisional monthly report of daily operations that is satisfactory to the Contracting Officer that tabulates and quantifies: (i) the Contractor's rights to the natural flow in the South Fork of the American River and its tributaries; (ii) the quantity of releases from the Contractor's upstream storage; (iii) the quantity of water outflows from bypass flows at the Kyburz Diversion Dam and releases from the El Dorado Powerhouse; (iv) the quantity of Non-Project Water diverted for consumptive purposes at El Dorado Forebay and Hazel Creek Tunnel; (v) the quantity of Non-Project Water introduced into Project Facilities pursuant to this Contract; and (vi) the actual daily quantities of Non-Project Water taken by the Contractor at the Contractor's Point(s) of Delivery. At the same time, the Contractor shall provide the Contracting Officer with operational reports demonstrating that the Contractor has operated its upstream reservoirs and other facilities in such a manner as to make sufficient

water available in Project Facilities for subsequent delivery of Non-Project Water to the Contractor pursuant to the Contractor's direct diversion and re-diversion rights under its State water rights for each month. By the 15th day of the same month the provisional report shall become final unless the Contractor provides an updated report to the Contracting Officer. The reports to the Contracting Officer shall be provided in paper and electronic formats approved by the Contracting Officer, with measurements of water in daily mean cubic feet per second and monthly acre-feet. In addition, the Contractor shall provide the Contracting Officer with copies of all reports on water rights, stream flows and diversions that are required during the term of this Contract by the California State Water Resources Control Board under Permit 21112.

(c) The Contractor shall advise the Contracting Officer on or before the 10th calendar day of each month of the actual daily quantities of Non-Project Water taken during the previous month by the Contractor at the Contractor's Point(s) of Delivery pursuant to this Contract.

PAYMENTS AND ADJUSTMENTS

5. (a) The Rates to be paid to the United States for Non-Project Water conveyed pursuant to this Contract are set forth in Exhibit B and are subject to annual adjustment pursuant to the then-current M&I Ratesetting Policy for the Project to cover all costs incurred from the conveyance of Non-Project Water.

(b) By December 31 of each Calendar Year, the Contracting Officer shall provide the Contractor with the final Rates to be in effect for the

upcoming Year, and such notification shall revise Exhibit B without amending this Contract.

(c) The Contractor shall pay for Non-Project Water conveyed pursuant to this Contract at the cost-of-service rate as calculated in accordance with the then-current M&I Ratesetting Policy for the Project.

(d) At the time the Contractor submits an initial schedule for the conveyance of Non-Project Water pursuant to subdivision (a) of Article 4 of this Contract, the Contractor shall pay the Contracting Officer one-half of the total amount payable for the Non-Project Water scheduled to be conveyed for the Year under this Contract. The Contractor shall pay the remainder of the amount payable for Non-Project Water scheduled to be conveyed for the Year on or before June 1 of the respective Year. Non-Project Water shall not be conveyed in advance of payment. Final adjustment between the advance payments for the Non-Project Water scheduled and payments for the quantities of Non-Project Water conveyed during each Year pursuant to this Contract shall be made as soon as practicable but no later than April 30th of the following Year.

(e) All revenues received from the use of Project Facilities, pursuant to subdivision (a) of this Article for conveyance of Non-Project M&I Water, shall be deposited into the Reclamation fund for use under the terms of the Reclamation Act as provided in Section 3 of the Act of February 21, 1911 (36 Stat. 925): *Provided*, That if the Act of February 21, 1911, is amended, superseded, or replaced, any new provisions addressing the distribution of revenues will apply to this Contract at the earliest possible date under the law.

(f) No refund shall be made by the United States to the Contractor of the payments made for conveyance of Non-Project Water introduced into the Project Facilities which remains therein for more than 30 days as described in subdivision (e) of Article 3.

(g) The payment of the Rates set forth in this Article 5 for the use of Excess Capacity are exclusive of any additional charges that the Contractor may assess its water users. In accordance with the Act of February 21, 1911 (36 Stat. 925), the Contractor may not impose on its water users any charge for the use of Excess Capacity that exceeds the total mount paid to the United States: *Provided*, That the Contractor may also charge its water users such additional amounts as are necessary to cover the Contractor's reasonable administrative costs in contracting with the United States for the use of Excess Capacity in the Project Facilities.

(h) If at any time the Contractor diverts more Non-Project Water from Project Facilities than the quantity that was introduced pursuant to subdivision (b) of Article 3 of this Contract, that additional quantity of Non-Project Water shall be deemed Project M&I Water. Payment for such Project Water shall be made at the applicable rate identified in the Contractor's Water Service Contract, and the quantity of such Project Water will be deducted from the quantity of Project Water to which the Contractor is entitled under the Contractor's Water Service Contract.(i) If the conditions identified in subdivision (h) of this Article arise, and it is determined by the Contracting Officer that the Contractor has utilized all of its Project Water available under the

Contractor's Water Service Contract, the Contractor shall make available additional Non-Project Water to be introduced into the Project Facilities which is sufficient to equal the quantity of water actually used, including the quantity(ies) of conveyance loss(es) specified in Exhibit C, and shall pay for this additional Non-Project Water at the Rates identified in Exhibit B.

(j) If the Contracting Officer determines the quantity of Non-Project Water conveyed to the Contractor pursuant to this Contract is less than the quantity for which the Contractor would otherwise have been required to pay, the amount of any overpayment by the Contractor shall be applied first to any accrued indebtedness arising out of this Contract then due and owing to the United States by the Contractor. Any amount of such overpayment then remaining shall be refunded or credited to the Contractor, as directed by the Contractor.

EXCESS CAPACITY

6. (a) The availability of Excess Capacity shall be determined solely by the Contracting Officer. Nothing contained in this Contract shall limit or preclude the United States from utilizing available capacity in the Project Facilities for the storage and conveyance of Project Water pursuant to Federal law, Reclamation law or policy, and existing contract(s); or for using Excess Capacity in the Project Facilities for the storage and conveyance of any other supplies of Non-Project Water.

(b) The Contracting Officer shall not be obligated to convey Non-Project Water during periods of maintenance or for other operating requirements that make the non-Project Water physically unavailable.

(c) If at any time the Contracting Officer determines that there will not be Excess Capacity in the Project Facilities sufficient to allow the Non-Project Water to be introduced into, conveyed, and delivered in accordance with an approved schedule submitted by the Contractor, the Contracting Officer shall so notify the Contractor in writing. Within 24 hours of said notice, the Contractor shall revise its schedule accordingly.

(d) No provision of this Contract shall be construed in any way as a basis for the Contractor to establish a priority to or a permanent right to the use of Excess Capacity in the Project Facilities nor to set a precedent to obligate the United States to enter into contracts with any other entities or individuals for the conveyance or storage of Non-Project Water.

RECEIPT AND DISTRIBUTION OF NON-PROJECT WATER - SALE, TRANSFER, OR EXCHANGE OF NON-PROJECT WATER

7. (a) The parties hereto acknowledge that this Contract does not grant any permission or entitlement to the Contractor to extract and/or divert Non-Project Water from the source(s) described on Exhibit C or to change the nature or place of use of its rights to said Non-Project Water in any way. It is the responsibility of the Contractor to comply with all applicable Federal, State, and local laws, rules and regulations, including, but not limited to, State water law in relation to the Non-Project Water. It is expressly understood by the parties that the United States is only providing conveyance capacity for the Non-Project Water and does not claim any interest in the acquisition or use of the Non-Project Water beyond the terms specifically set forth in this Contract.

(b) The Contracting Officer makes no representations as to the accuracy of the description or of the validity of the Contractor's rights to the Non-Project Water described in Exhibit C.

UNITED STATES NOT RESPONSIBLE FOR CONVEYANCE OF NON-PROJECT WATER

8. The United States shall not be responsible for the control, care, or distribution of the Non-Project Water before it is introduced into Project Facilities or after it is conveyed to the Contractor's Point(s) of Delivery.

UNITED STATES NOT LIABLE

9. (a) The United States, its officers, agents and employees, shall not be responsible for the control, care, or distribution of the Non-Project Water before it is introduced into or diverted from the Project Facilities. It is specifically understood by the parties hereto that the United States is only providing conveyance capacity for the Non-Project Water and does not claim any interest in the acquisition or use of the Non-Project Water beyond the terms specifically set forth in this Contract.

(b) The Contractor shall indemnify and hold the United States and its officers, agents, and employees harmless from legal liability for every claim for damages of any nature whatsoever arising out of any action or omissions of the Contractor, its officers, agents and employees, resulting from the Contractor's performance of this Contract, including the manner or method in which the Non-Project Water identified in Exhibit C is introduced into and diverted from the Project Facilities. The Contractor further releases the United States, its officers, agents, and employees from every claim for damage to persons or property, direct or indirect, resulting from the Contracting Officer's: (i) determinations of the amount of Excess Capacity available in Project Facilities for

the conveyance of Non-Project Water to the Contractor; (ii) determination that the introduction of Non-Project Water into the Project Facilities must be terminated; and (iii) elimination from Exhibit C of any source(s) of Non-Project Water. Nothing contained in this Article shall be construed as an assumption of liability by the Contractor with respect to such matters.

OPINIONS AND DETERMINATIONS

10. (a) Where the terms of this Contract provide for actions to be based upon the opinion or determination of either party to this Contract, said terms shall not be construed as permitting such action to be predicated upon arbitrary, capricious, or unreasonable opinions or determinations. Both parties, notwithstanding any other provisions of this Contract, expressly reserve the right to relief from and appropriate adjustment for any such arbitrary, capricious, or unreasonable opinion or determination. Each opinion or determination by either party shall be provided in a timely manner: *Provided*, That nothing in this subdivision (a) of this Article is intended to or shall affect or alter the standard of judicial review applicable under Federal law to any opinion or determination implementing a specific provision of Federal law embodied in statute or regulation.

(b) The Contracting Officer shall have the right to make determinations necessary to administer this Contract that are consistent with the provisions of this Contract, the laws of the United States and the State of California, and the rules and regulations promulgated by the Secretary. Such

determinations shall be made in consultation with the Contractor to the extent reasonably practicable.

CONTRACTOR TO PAY CERTAIN MISCELLANEOUS COSTS

11. In addition to all other payments to be made by the Contractor pursuant to this Contract, the Contractor shall pay to the United States, within 60 days after receipt of a bill and detailed statement submitted by the Contracting Officer to the Contractor, for such specific items of direct cost incurred by the United States for work requested by the Contractor associated with this Contract plus indirect costs in accordance with applicable Reclamation policy and procedures. All such amounts referred to in this Article shall not exceed the amount agreed to in writing in advance by the Contractor. This Article shall not apply to costs for routine Contract administration.

WATER CONSERVATION

12. (a) Prior to the delivery of water provided from or conveyed through federally constructed or federally financed facilities pursuant to this Contract, the Contractor shall develop a water conservation plan, as required by Section 210(b) of the Reclamation Reform Act of 1982 and 43 C.F.R. 427.1 (Water Conservation Rules and Regulations).

(b) The parties hereto acknowledge and agree that the water conservation plan/program the Contractor is currently implementing is satisfactory and has been approved by the Contracting Officer. Said water conservation plan shall be deemed to meet the requirements of subdivision (a) of this Article. Said water conservation plan shall be reviewed every 5 years and revised, as necessary, as determined by the Contracting Officer: *Provided*, That the Contractor, prior to the execution of this Contract, documents to the

satisfaction of the Contracting Officer that the quantity of Non-Project Water to be conveyed pursuant to this Contract has been included into its approved water conservation plan and that all Non-Project Water shall be subject to such water conservation requirements.

MEDIUM FOR TRANSMITTING PAYMENTS

13. (a) All payments from the Contractor to the United States under this Contract shall be by the medium requested by the United States on or before the date payment is due. The required method of payment may include checks, wire transfers, or other types of payment specified by the United States.

(b) Upon execution of the Contract, the Contractor shall furnish the Contracting Officer with the Contractor's taxpayer's identification number (TIN). The purpose for requiring the Contractor's TIN is for collecting and reporting any delinquent amounts arising out of the Contractor's relationship with the United States.

CHARGES FOR DELINQUENT PAYMENTS

14. (a) The Contractor shall be subject to interest, administrative and penalty charges on delinquent payments. If a payment is not received by the due date, the Contractor shall pay an interest charge on the delinquent payment for each day the payment is delinquent beyond the due date. If a payment becomes 60 days delinquent, the Contractor shall pay, in addition to the interest charge, an administrative charge to cover additional costs of billing and processing the delinquent payment. If a payment is delinquent 90 days or more, the Contractor shall pay, in addition to the interest and administrative charges, a penalty charge for each day the payment is delinquent beyond the due date, based on the remaining balance of the payment due at the rate of 6 percent per year. The Contractor shall also pay any fees incurred for debt collection services associated with a delinquent payment.

(b) The interest charge rate shall be the greater of either the rate prescribed quarterly in the Federal Register by the Department of the Treasury for application to overdue payments, or the interest rate of 0.5 percent per month. The interest charge rate will be determined as of the due date and remain fixed for the duration of the delinquent period.

(c) When a partial payment on a delinquent account is received, the amount received shall be applied first to the penalty charges, second

to the administrative charges, third to the accrued interest, and finally to the overdue payment.

PROTECTION OF WATER AND AIR QUALITY

15. (a) Project Facilities used to make available and deliver water to the Contractor shall be operated and maintained in the most practical manner to maintain the quality of the water at the highest level possible as determined by the Contracting Officer: *Provided*, That the United States does not warrant the quality of the water delivered to the Contractor and is under no obligation to furnish or construct water treatment facilities to maintain or improve the quality of water delivered to the Contractor.

(b) The Contractor shall comply with all applicable water and air pollution laws and regulations of the United States and the State of California; and shall obtain all required permits or licenses from the appropriate Federal, State, or local authorities necessary for the delivery of water by the Contractor; and shall be responsible for compliance with all Federal, State, and local water quality standards applicable to surface and subsurface drainage and/or discharges generated through the use of Federal or Contractor facilities or Project Water provided by the Contractor within the Contractor's Project Water Service Area.

(b.1) The Contracting Officer has included the Project 184 Water Quality Monitoring Plan Version 3.0 dated March 8, 2007 (Plan) as Exhibit F of this Contract. This Plan will serve as a baseline water quality monitoring plan that will be compared to water quality monitoring results to aid Reclamation in determining that the Contractor's Non-Project Water entering Project Facilities does not degrade the quality of Project Water. This baseline Plan will comply with the rules and regulations as noted in subparagraph (b) above. If the Plan is modified in future years as contemplated within the Plan, at a minimum water quality monitoring data shall be collected at the monitoring station located at the South Fork American River downstream of the Kyburz Diversion Dam once bi-annually during midsummer and a report documenting the monitoring results shall be sent to Reclamation within 30 days of preparation. If at any time during the

term of the Contract the Non-Project Water delivered by the Contractor does not meet those standards as established by the Plan or has the potential to significantly degrade the quality of Project Water based upon the results at the monitoring station located at the South Fork American River downstream of the Kyburz Diversion Dam, the Contractor will immediately provide written notification to Reclamation as specified in Article 14(d) below. Reclamation has reviewed the water quality monitoring reports for monitoring conducted in 2008 and 2010 pursuant to the Plan and has concluded that this type of data is sufficient for Reclamation to determine that the quality of Non-Project Water entering Project Facilities does not degrade the quality of Project Water. The Contracting Officer reserves the right to request additional reasonable water quality monitoring if the Contracting Officer reasonably determines that significant changes upstream of the monitoring station located at the South Fork American River downstream of the Kyburz Diversion Dam, such as changes in mining operations, regulatory requirements, land use changes, or any other actions that have the potential to impact the quality of the Non-Project Water that is introduced into Project Facilities.

(c) This article shall not affect or alter any legal obligations of the Secretary to provide drainage or other discharge services.

(d) The Non-Project Water introduced into the Project Facilities shall be of such quality, as determined solely by the Contracting Officer, as to not significantly degrade the quality of the Project Water in the Project Facilities. If it is determined by the Contracting Officer that the quality of the

Non-Project Water, identified in Exhibit C, will significantly degrade the quality of Project Water in the Project Facilities, the Contractor, upon receipt of electronic written notice from the Contracting Officer, shall immediately take any and all reasonable action(s) within the Contractor's authority and control, to eliminate the source of such degradation. If, due to an unexpected event, the quality of the Non-Project Water is adversely impacted, the Contractor shall immediately: (i) inform the Contracting Officer and the CVO of Reclamation in Sacramento, California by electronic means of the adverse condition(s) impacting the quality of the Non-Project Water; (ii) take all necessary steps to mitigate the adverse condition(s); (iii) conduct any and all appropriate monitoring of the source of the water quality degradation and shall report monitoring results to the Contracting Officer and to CVO immediately upon receipt of such results; and (iv) take all reasonable steps to terminate the introduction of the adversely impacted Non-Project Water into the Project Facilities. If the source of such degradation is beyond the authority and control of the Contractor, the Contractor shall promptly notify the Contracting Officer in electronic writing of the cause of such degradation and report all available monitoring results from local, state, and Federal agencies with authority over such activity to the Contracting Officer and CVO. The Contractor will continue to monitor and mitigate such adverse events until such time as the Contracting Officer determines that the quality of the Non-Project Water will no longer significantly degrade the quality of Project Water in the Project Facilities and notifies the Contractor of such fact in writing.

GENERAL OBLIGATION – BENEFITS CONDITIONED UPON PAYMENT

16. (a) The obligation of the Contractor to pay the United States as provided in this Contract is a general obligation of the Contractor notwithstanding the manner in which the obligation may be distributed among the Contractor's water users and notwithstanding the default of individual water users in their obligations to the Contractor.

(b) The payment of charges becoming due pursuant to this Contract is a condition precedent to receiving benefits under this Contract. The United States shall not make water available to the Contractor through Project Facilities during any period in which the Contractor is in arrears in the advance payment of water Rates due the United States. The Contractor shall not deliver water under the terms and conditions of this Contract for lands or parties that are in arrears in the advance payment of water Rates as levied or established by the Contractor.

RULES, REGULATIONS, AND DETERMINATIONS

17. (a) The parties agree that the delivery of water or the use of Federal facilities pursuant to this Contract is subject to Federal Reclamation law, as amended and supplemented, and the rules and regulations promulgated by the Secretary under Federal Reclamation law.

(b) The Contracting Officer shall have the right to make determinations necessary to administer this Contract that are consistent with its provisions, the laws of the United States and the State of California, and the rules and regulations promulgated by the Secretary of the Interior. Such determinations shall be made in consultation with the Contractor.

EQUAL EMPLOYMENT OPPORTUNITY

18. During the performance of this Contract, the Contractor agrees as follows:

(a) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, disability, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, disability, or national origin. Such action shall include, but not be limited to the following: employment upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be

provided by the Contracting Officer setting forth the provisions of this nondiscrimination clause.

(b) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, disability, or national origin.

(c) The Contractor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the Contracting Officer, advising the labor union or workers' representative of the Contractor's commitments under Section 202 of Executive Order 11246 of September 24, 1965 (EO 11246), and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(d) The Contractor will comply with all provisions of EO 11246, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(e) The Contractor will furnish all information and reports required by EO 11246, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to its books, records, and accounts by the Contracting Agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(f) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this Contract or with any of the such rules, regulations, or orders, this Contract may be canceled, terminated or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in EO 11246, and such other sanctions may be imposed and remedies invoked as provided in EO 11246 or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(g) The Contractor will include the provisions of paragraphs (a) through (g) in every subcontract or purchase order unless exempted by the rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of EO 11246, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as may be directed by the Secretary of Labor as a means of enforcing such provisions, including sanctions for noncompliance: *Provided, however*, That in the event the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction, the Contractor may request that the United States enter into such litigation to protect the interests of the United States.

BOOKS, RECORDS AND REPORTS

19. (a) The Contractor shall establish and maintain accounts and other books and records pertaining to administration of the terms and conditions of this Contract, including the Contractor's financial transactions; water supply data; project operation, maintenance, and replacement logs; project land and rights-of-way use agreements; the water users' land-use (crop census), land-ownership, land-leasing, and water-use data; and other matters that the Contracting Officer may require. Reports shall be furnished to the Contracting Officer in such form and on such date or dates as the Contracting Officer may require. Subject to applicable Federal laws and regulations, each party to this Contract shall have the right during office hours to examine and make copies of the other party's books and records relating to matters covered by this Contract.

(b) Notwithstanding the provisions of subdivision (a) of this Article, no books, records, or other information shall be requested from the Contractor by the Contracting Officer unless such books, records, or information are reasonably related to the administration or performance of this Contract. Any such request shall allow the Contractor a reasonable period of time within which to provide the requested books, records, or information.

CONTINGENT ON APPROPRIATION OR ALLOTMENT OF FUNDS

20. The expenditure or advance of any money or the performance of any obligation of the United States under this Contract shall be contingent upon appropriation or allotment of funds. Absence of appropriation or allotment of funds shall not relieve the Contractor from any obligations under this Contract. No liability shall accrue to the United States in case funds are not appropriated or allotted.

ASSIGNMENT LIMITED – SUCCESSORS AND ASSIGNS OBLIGATED

21. The provisions of this Contract shall apply to and bind the successors and assigns of the parties hereto, but no assignment or transfer of this Contract or any right or interest therein by either party shall be valid until approved in writing by the other party.

OFFICIALS NOT TO BENEFIT

22. No Member of or Delegate to the Congress, Resident Commissioner, or official of the Contractor shall benefit from this Contract other than as a water user or landowner in the same manner as other water users or landowners.

COMPLIANCE WITH CIVIL RIGHTS LAWS AND REGULATIONS

23. (a) The Contractor shall comply with Title VI of the Civil Rights Act of 1964 (Pub. L. 88-352; 42 U.S.C. § 2000d), the Rehabilitation Act of 1973 (Pub. L. 93-112, Title V, as amended; 29 U.S.C. § 791, et seq.), the Age Discrimination Act of 1975 (Pub. L. 94-135, Title III; 42 U.S.C.§ 6101, et seq.), Title II of the Americans with Disabilities Act of 1990 (Pub. L. 101-336; 42 U.S.C. § 12131, et seq.), and any other applicable civil rights laws, and with the applicable implementing regulations and any guidelines imposed by the United States Department of the Interior and/or Bureau of Reclamation.

(b) These statutes prohibit any person in the United States from being excluded from participation in, being denied the benefits of, or being otherwise subjected to discrimination under any program or activity receiving financial assistance from the Bureau of Reclamation on the grounds of race, color, national origin, disability, or age. By executing this Contract, the Contractor agrees to immediately take any measures necessary to implement this obligation, including permitting officials of the United States to inspect premises, programs, and documents.

(c) The Contractor makes this agreement in consideration of and for the purpose of obtaining any and all Federal grants, loans, contracts, property discounts, or other Federal financial assistance extended after the date hereof to the Contractor by the Bureau of Reclamation, including installment payments after such date on account of arrangements for Federal financial assistance which were approved before such date. The Contractor recognizes and agrees that such Federal assistance will be extended in reliance on the representations and agreements made in this Article and that the United States reserves the right to seek judicial enforcement thereof.

(d) Complaints of discrimination against the Contractor shall be investigated by the Contracting Officer's Office of Civil Rights.

CERTIFICATION OF NONSEGREGATED FACILITIES

24. The Contractor hereby certifies that it does not maintain or provide for its employees any segregated facilities at any of its establishments and that it does not permit its employees to perform their services at any location under its control where segregated facilities are maintained. It certifies further that it will

not maintain or provide for its employees any segregated facilities at any of its establishments and that it will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The Contractor agrees that a breach of this certification is a violation of the Equal Employment Opportunity clause in this Contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, or national origin, because of habit, local custom, disability, or otherwise. The Contractor further agrees that (except where it has obtained identical certifications from proposed subcontractors for specific time periods) it will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding $10,000 which are not exempt from the provisions of the Equal Employment Opportunity clause; that it will retain such certifications in its files; and that it will forward the following notice to such proposed subcontractors (except where the proposed subcontractors have submitted identical certifications for specific time periods):

NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENT FOR CERTIFICATIONS OF NONSEGREGATED FACILITIES

A Certification of Nonsegregated Facilities must be submitted prior to the award of a subcontract exceeding $10,000 which is not exempt from the provisions of the Equal Employment Opportunity clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually). Note: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

CHANGES IN CONTRACTOR'S ORGANIZATION

25. While this Contract is in effect, no change may be made in the Contractor's organization, which may affect the respective rights, obligations, privileges, and duties of either the United States or the Contractor under this Contract including, but not limited to, dissolution, consolidation, or merger, except upon the Contracting Officer's written consent. For purposes of this Contract, the inclusion or exclusion of lands is not a change in the Contractor's organization that is subject to this Article.

CONFIRMATION OF CONTRACT

26. Promptly after the execution of this Contract, the Contractor shall provide to the Contracting Officer a certified copy of a final decree of a court of competent jurisdiction in the State of California, confirming the proceedings on the part of the Contractor for the authorization of the execution of this Contract.

This Contract shall not be binding on the United States until such final decree has been secured.

CONTRACT DRAFTING CONSIDERATIONS

27. This Contract has been negotiated and reviewed by the parties hereto, each of whom is sophisticated in the matters to which this Contract pertains. Articles 1 through 27 of this Contract have been drafted, negotiated and reviewed by the parties, and no one party shall be considered to have drafted the stated articles.

NOTICES

28. Any notice, demand, or request authorized or required by this Contract shall be deemed to have been given, on behalf of the Contractor, when mailed, postage prepaid, or delivered to the Area Manager, Bureau of Reclamation, 7794 Folsom Dam Road, Folsom, California 95630-1799, and on behalf of the United States, when mailed, postage prepaid, or delivered to the Board of Directors, El Dorado Irrigation District, Attention: General Manager, 2890 Mosquito Road, Placerville, California 95667. The designation of the addressee or the address may be changed by notice given in the same manner as provided in this Article for other notices.

IN WITNESS WHEREOF, the parties hereto have executed this Contract as of the day and year first above written.

THE UNITED STATES OF AMERICA

By: _____

Area Manager
Central California Area Office
Mid-Pacific Region
Bureau of Reclamation

(SEAL)

EL DORADO IRRIGATION DISTRICT

By: _____

General Manager

Attest:

By: _____

Clerk to the Board of Directors
El Dorado Irrigation District

EXHIBIT A

CONTRACTOR'S BOUNDARY MAP
PLACEHOLDER

EXHIBIT B

201X CONVEYANCE RATES
PLACEHOLDER

Central Valley Project Warren Act Contracts,
Municipal and Industrial Water,
Per Acre-Foot

Cost Component	Cost of Service
Water Marketing	
Storage	
O&M	
Capital	
Other Cost	
Total Cost of Service	

EXHIBIT C

SOURCE(S) OF CONTRACTOR'S NON-PROJECT WATER

The sources of Non-Project Water shall be the Contractor's direct diversion rights for water of the South Fork American River at the Kyburz diversion dam, and rights for diversion for storage in Caples Lake in Alpine County, Silver Lake in Amador County and Lake Aloha in El Dorado County, granted in Permit 21112 by the California State Water Resources Control Board. The water rights covered in Permit 21112 are made available by the operation of existing facilities of the Federal Energy Regulatory Commission (FERC) "Project 184". The quantity of Non-Project Water available under the Contract, up to 8,500 acre-feet each year that will be conveyed to the Contractor will be the outflow of Non-Project Water from bypassed flows at the Kyburz diversion dam and releases from the El Dorado Powerhouse, minus 15% of this outflow for conveyance losses, and minus the diversions of such water at El Dorado Forebay and Hazel Creek Tunnel.

EXHIBIT D

COOPERATIVE AGREEMENT No. R14AC00061

EXHIBIT E

GAGING PLAN

Water Measurement

The Contractor will utilize gages to measure the volume of water introduced and diverted from Folsom Reservoir. The Contractor maintains gages to ensure compliance with minimum streamflows as required by the Federal Energy Regulatory Commission (FERC) license for the El Dorado Hydroelectric Project No. 184 (Project 184). Additionally, the Contractor maintains measurement devices for documenting volumes of water diverted from: 1) Folsom Reservoir at Folsom Lake Raw Water Pump Station, and 2) Forebay Reservoir at the Main Ditch to Reservoir 1.

For each month, consistent with Article 4(b) before the 15th day of the succeeding month, the Contractor will provide all reports of daily operations that contain the following information:

1. Gaging records documenting the total volume (af) delivered to Folsom Reservoir calculated from average daily flow below the Kyburz diversion dam (A12; USGS 11439500)

2. Gaging records documenting the total volume (af) delivered to Folsom Reservoir calculated from total daily volume through the El Dorado Powerhouse (A19)

3. Gaging records documenting the total volume (af) diverted from Folsom Reservoir at the Folsom Lake Raw Water Pump Station

4. Gaging records documenting the total volume (af) released from Caples Lake calculated from average daily flow measured on Caples Creek at Caples Lake outlet (A6; USGS 11436999)

5. Gaging records documenting the total volume (af) released from Silver Lake calculated from average daily flow measured on Silver Fork at the Silver Lake outlet (A9; USGS 11436000)

6. Gaging records documenting the total volume (af) of leakage from Silver Lake calculated from average daily flow measured on Oyster Creek at Highway 88 (A24)

7. Gaging records documenting the total volume (af) released from Lake Aloha calculated from average daily flow measured on Pyramid Creek above Highway 50 (A40; USGS 11435100)

8. Gaging records documenting the total volume (af) diverted into the El Dorado Canal calculated from average daily flow measured on Canal at diversion (A11; USGS 11439000)

9. Gaging records documenting the total volume (af) diverted at Main Ditch to Reservoir 1 for consumptive use calculated from average daily flow measured on Forebay outlet to EID (A18)

10. Gaging records documenting the total volume (af) diverted at Hazel Tunnel to Jenkinson Lake for consumptive use calculated from average daily flow measured at Hazel Tunnel Diversion (H1)

Water Accounting

Direct diversion rights from the South Fork American River are available from November 1 through July 31. Direct diversions are not available August 1 through October 31 pursuant to the conditions of Permit 21112; therefore, water diverted to storage will be released from Lake Aloha, Caples Lake, and Silver Lake for downstream uses. The approximate volume from each water source will be included during each monthly reporting.

The quantity of Non-Project Water made available for diversion at the Contractor's Point of Delivery shall be calculated as follows:

1) Nov 1 - July 31: (1 - Conveyance Loss) x {South Fork of the American River below Kyburz diversion dam (A12) + El Dorado Powerhouse (A19)}

2) Aug 1 - Oct 31: (1 - Conveyance Loss) x {Caples Creek at Caples Lake Outlet (A6) + Silver Fork at Silver Lake Outlet (A9) + Silver Lake Leakage (A24) + Pyramid Creek above Highway 50 (A40)} - {the greater of [0] or [Forebay outlet to EID (A18) + Hazel Tunnel (H1) - NF]}

   Where: Natural Flow (NF) = {[South Fork of the American River below Kyburz diversion dam (A12) + El Dorado Canal at diversion (A11)] - [Caples Creek at Caples Lake Outlet (A6) + Silver Fork at Silver Lake Outlet (A9) + Silver Lake Leakage (A24) + Pyramid Creek above Highway 50 (A40))}

EXHIBIT F
WATER QUALITY MONITORING

EXHIBIT G
FOREGONE POWER

FORMULA TO ESTIMATE FOREGONE POWER COSTS

1. Ten Year Avg KWh/AF efficiencies (2001-2011):
   Folsom 259.84 KWh per AF
   Nimbus 33.81 KWh per AF

2. Average Annual Market Price = $36.00 per MWh

3. Formula:

$$\frac{\text{Folsom (259.84) + Nimbus (33.81) X Average Annual Market Price}}{\text{1000KWh}} = \$/AF \text{ of Warren Act Water}$$

((259.84 KWh/AF + 33.81 KWh/AF)/1000) x $36 = $10.57/af (**Estimated** cost per acre foot for foregone power due to EID diverting Project 184 Warren Act water at Folsom Reservoir).

4. The Contractor can then take the $10.57/af and multiply this number by the amount of Project 184 water that they will divert in a Year, to come up with the total estimated cost of foregone power resulting from diverting this water at Folsom Reservoir.

5. The Estimated cost per acre-foot for foregone power diversion of Project 184 water will be trued up to an actual number at the end of each Year.

ADVANCE PAYMENT AND TRUE UP PROCESS FOR FOREGONE POWER COSTS

A Letter of Agreement (LOA) will be established with the Contractor which will document the process for the advance payment of the estimated foregone power cost pursuant to Article 3(f.1) and the true up process for the actual foregone power costs each Year.