ENV358

Environmental Assessment and
Finding of No Significant Impact

for the

El Dorado Hills Raw Water Pumping Station Temperature Control Device Project

EDAW

OCTOBER 2002

United States Bureau of Reclamation

FINDING OF NO SIGNIFICANT IMPACT

EL DORADO HILLS RAW WATER PUMPING STATION TEMPERATURE CONTROL DEVICE

(October 2002)

In accordance with the National Environmental Policy Act of 1969, as amended, and based on the following, the U.S. Bureau of Reclamation (Reclamation) has determined that the construction and operation of the El Dorado Hills Raw Water Pumping Station Temperature Control Device (TCD) would not result in a significant impact on the human environment, and that an environmental impact statement is not required for this project.

The purpose of the proposed action is to minimize El Dorado Irrigation District's (EID's) withdrawal of cold water from Folsom Lake, thereby conserving cold water storage for release into the lower American River. Maintaining the maximum cold water pool volume in Folsom Lake is critically important to allow for sustained cold water releases into the lower American River to benefit and enhance chinook salmon and steelhead trout production.

The proposed TCD is a steel enclosed structure, which would be partially buried in the bank of Folsom Lake at the existing EID Pump Station. Currently, the structure is square in shape, however, as an alternative, a large cylindrical pipe may be selected once cost and structural integrity have been evaluated. The potential impacts of the TCD would not be affected by the geometry of the structure. Most of the structure would be below the high water elevation of Folsom Lake allowing water to be removed from the lake at various elevations. The TCD consists of a steel structure 8 feet wide by 8 feet high and approximately 200 feet long. The proposed action includes digging a trench for the TCD approximately 2 feet deep on the shore end and 7 feet deep at the lower end in the lake. Concrete footings connected by angle bar railings would be installed at various locations along the trench to provide support to the structure. Construction of the entire project would be conducted during an approximate 3-month period in fall or winter, when Folsom Reservoir water levels are reduced for flood control operation.

A Draft Environmental Assessment (EA) was completed in August 2002 and submitted to resources agencies for their review. Written comments were received from the National Marine Fisheries Service (NMFS) and the California Department of Fish and Game (DFG). NMFS stated that they concurred that the project "is not likely to adversely affect the Central Valley steelhead or EFG for Pacific Salmon," and DFG expressed support for the project. This Finding of No Significant Impact is based on the following as described in the EA:

1. Special-status plant and wildlife species would not be affected by the project.

2. The proposed action would not increase water supply availability, or increase the use of existing EID supplies, and therefore does not induce growth-related effects.

3. The quantity and timing of water being released from Folsom Dam would remain unchanged, but the cold water conserved in Folsom Reservoir would be available to enhance conditions for anadromous salmonid fish species in the lower American River.

4. The proposed action incorporates measures to: minimize water quality effects from sedimentation, soil erosion, and runoff during construction; minimize effects to any unanticipated

cultural resources found during construction; and minimize air quality and noise effects during construction. Increases in traffic, noise, and air pollution would be minor.

5. Geology and soils, hazardous materials, recreational resources, visual resources, and cultural resources would not be affected by the proposed action.

6. The proposed action would not affect any Indian Trust Assets.

7. The proposed action would not disproportionately impact minority and disadvantaged populations or communities.

8. The proposed action would be constructed in accordance with the lakebed alteration agreement from CDFG, a water quality certification from the Regional Water Quality Control Board (RWQCB), and Clean Water Act Section 404 compliance through the U.S. Army Corps of Engineers (Corps).

9. The project has been coordinated with the Corps, CDFG, NMFS, U.S. Fish and Wildlife Service, California Department of Parks and Recreation, RWQCB, and EID.

Recommended:

Roderick M Hall — 10/29/02

Environmental Specialist — Date

Approved:

Thomas J Aiken — 10/29/02

Area Manager — Date

FONSI NO. CCAO R-2

Environmental Assessment
and
Finding of No Significant Impact

for the

El Dorado Hills Raw Water Pumping Station Temperature Control Device Project

---

prepared by:

Bureau of Reclamation
Central California Area Office
7794 Folsom Dam Road
Folsom, CA 95630
Contact: Rod Hall
916-989-7297

with assistance from:

EDAW, Inc.
2022 J Street
Sacramento, CA 95814
Contact: Phil Dunn
916-414-5800

EDAW

1T034.01

OCTOBER 2002

ENVIRONMENTAL ASSESSMENT
FOR THE
EL DORADO HILLS RAW WATER PUMPING STATION
TEMPERATURE CONTROL DEVICE

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

LIST OF TABLES

LIST OF EXHIBITS

1 INTRODUCTION

1.1 PURPOSE OF THIS DOCUMENT

This Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) have been prepared to comply with the National Environmental Policy Act (NEPA) and addresses the environmental impacts of constructing and operating a Temperature Control Device (TCD) at El Dorado Irrigation District's (EID's) El Dorado Hills Raw Water Pump Station (Pump Station). **The project, which would be located on the south bank of Folsom Reservoir, is being proposed to minimize EID's withdrawal of cold water and facilitate water withdrawals at various reservoir elevations. Maintaining the maximum coldwater pool volume in Folsom Lake is critically important to allow for sustained coldwater releases into the lower American River to benefit and enhance chinook salmon and steelhead trout survival.**

This EA has been prepared to identify impacts associated with the proposed project and alternatives and to allow the responsible federal official to determine whether to prepare a FONSI or an EIS in compliance with NEPA. A companion Initial Study is being prepared in compliance with the California Environmental Quality Act (CEQA) and the State CEQA Guidelines. The U.S. Bureau of Reclamation (Reclamation) and EID are the lead Federal agency and lead State agency, respectively. This document also conforms to Reclamation's NEPA Handbook. This EA describes the proposed project, the alternatives (including the No-Action Alternative), affected environment, and the environmental consequences as required in the U.S. Council on Environmental Quality (CEQ) Guidelines 40 CFR, Chapter V, Sections 1508.7 and 1508.8.

1.2 PUBLIC PARTICIPATION

Consultation and coordination of Reclamation with the public and other responsible agencies is recommended by the CEQ. To ensure that provisions of NEPA are met, Reclamation issued a public notice upon release of the draft EA and mailed the public notice to several agencies and potentially interested parties. The draft EA was circulated for public and agency review and comment for 30 days. The comment period ended 30 days after the document was publicly noticed.

Based on comments received on the draft EA, a final EA and FONSI have been prepared .

1.3 DOCUMENT ORGANIZATION

The format of this EA is based on Reclamation's NEPA guidelines (U.S. Bureau of Reclamation 2000) and is organized into the following sections:

- Section 1, **Introduction**
- Section 2, **Purpose and Need**
- Section 3, **Proposed Action and Alternatives**
- Section 4, **Affected Environment and Environmental Consequences**
- Section 5, **Consultation and Coordination**
- Section 6, **Compliance with Environmental Statutes**
- Section 7, **List of Preparers**
- Section 8, **References**

2 PURPOSE AND NEED

The completion of Folsom Dam in 1955 transformed a portion of the American River from a lotic (free-flowing) environment into a lentic (lake-like) environment. Folsom Lake has a maximum storage capacity of approximately 977,000 acre-feet (AF), and has a maximum depth of approximately 266 feet. Strong thermal stratification occurs within Folsom Lake annually between April and November. Thermal stratification establishes a warm surface water layer (epilimnion), a middle water layer characterized by decreasing temperature with increasing depth (metalimnion or thermocline), and a bottom, coldwater layer (hypolimnion) within the lake.

The lake's coldwater pool is not only important to the lake's coldwater fish species, but it is also critically important to lower American River fall-run chinook salmon and steelhead trout. Seasonal releases from the reservoir's coldwater pool provide thermal conditions in the lower American River that support annual in-river production of these salmonid species. Any reduction in the lake's coldwater pool reduces the volume of cold water that is available to be released in any given year into the lower American River to benefit the river's chinook salmon and steelhead populations. Folsom Lake's annual coldwater pool is not large enough to optimally sustain coldwater releases during the warmest months (i.e., July - September) to benefit lower American River steelhead and to make coldwater releases during October and November that would maximally benefit fall-run chinook salmon migration, spawning, and incubation. In some years, substantial mortality has occurred to chinook salmon, in particular, because the coldwater pool was depleted through naturally low runoff conditions and extractions by water purveyors. Consequently, conservation and management of the lake's coldwater pool on an annual basis is essential to provide the maximum thermal benefits to both fall-run chinook salmon and steelhead, within the constraints of coldwater pool availability.

Currently, EID's Pump Station is extracting water from elevation 315 feet near the bottom of Folsom Lake and entirely within the coldwater pool. To address this issue, Reclamation has requested that EID take water from Folsom Lake having a temperature above 65° F.

The purpose of the proposed action, therefore, is to minimize EID's withdrawals from the coldwater pool, thereby conserving coldwater storage for release into the lower American River to enhance salmon and steelhead production.

Although not a primary purpose of the project, installing the TCD provides additional benefits to EID. EID has identified several problems with the existing pumps and casings that would be resolved by installing the TCD. Although the water taken by this station has been a reliable supply of cool water that is low in organic content, it occasionally carries silt, especially after a rain. Having the ability to extract water at different elevations also allows for less sediment to be carried up the casings and through the treatment plant. The existing 18-inch tubes are also thought to be near the end of service after 40 years of operation. Due to engineering and structural problems, the pumps in two of the three 20-inch tubes have recently failed. Installing the TCD would provide replacement casings for the existing pumps.

The proposed action does not increase EID's installed maximum capacity of 7,550 AF/year. The proposed action only serves to change the elevation of water withdrawal from Folsom Lake and not the quantity or timing of water pumped by EID.

3 PROPOSED ACTION AND ALTERNATIVES

3.1 PROPOSED ACTION

The El Dorado Hills Raw Water Pump Station is located in El Dorado County, California (Exhibit 1) on the south bank of Folsom Lake, about 2 miles upstream from Folsom Dam. It is accessible by Planeta Way off of Guadeloupe Drive, just north of Francisco Drive in El Dorado Hills, CA (Exhibit 2). Currently, there are two 18-inch casings installed in 1960 and an additional three 20-inch casings installed in 1993. Water enters the casings at the lower end of the tubes and is pumped up to the surface and then on to the treatment plant approximately 1 mile away. The pumps are cycled on and off to meet the demand of the treatment plant and service area.

The proposed TCD is a steel enclosed structure that would be partially buried in the bank of Folsom Lake at the existing EID Pump Station. Currently, the structure is square in shape, however, as an alternative, a large cylindrical pipe may be selected once cost and structural integrity have been evaluated. The potential impacts of the TCD would not be affected by the geometry of the structure. Most of the structure would be below the high water elevation of Folsom Lake allowing water to be removed from the lake at various elevations, therefore providing the ability to select water having a desired temperature.

The structure consists of a steel box 8 feet wide by 8 feet high and approximately 200 feet long. The TCD is designed in segments approximately 40 feet in length. Each end of the segments has a flange around the sides to allow the segments to be bolted together into a box structure that is approximately 200 feet long. The top of the box has five solid cover slide gates at various locations along the 200-foot length. These gates, when opened, allow water to be extracted at various reservoir elevations. More than one gate can be opened at a time to facilitate mixing and better water temperature management. Covering each slide gate is a stainless steel screen to prevent debris and fish from entering the structure. Inside the structure are pump casings into which submersible pumps will be installed. The casings positioned along the bottom and each side of the structure form a large channel just below the slide gates. When the slide gates are opened, lake water will enter the chamber flowing to the bottom of the structure where it will be pumped to EID's booster pump station by the submersible pumps. The booster pump station then pumps the raw water to the El Dorado Hills Water Treatment Plant.

The proposed TCD structure will include ten new casings. The existing five pumps now used by EID would be relocated to the TCD structure. The remaining five casings would not be used at this time. Although a total of ten casings has been included in the proposed TCD structure, no additional pumps or pumping capacity would be possible with implementation of this project.

3.1.1 CONSTRUCTION

The trench for the TCD would be excavated under two different conditions: above the water surface of Folsom Lake and below the water surface. The above water excavation would require an excavator supported by cables and attached to a large piece of equipment parked in the paved work area at the Pump Station. The below water excavation would require a floating barge/dredge. Spoil materials containing mainly rock and sandy fines may be used as rip-rap along the bank near the TCD. Spoils containing mainly clay material would be removed and disposed of at a public landfill or county-approved project in accordance with applicable regulations.

The trench depth would range from approximately 2 feet deep on the shore end to 7 feet deep at the lower end in the lake. Hydro-hammers attached to excavation equipment may be required if hard rock is encountered during excavation. In the unlikely event that extremely hard rock is encountered, limited drilling and blasting may also be necessary.

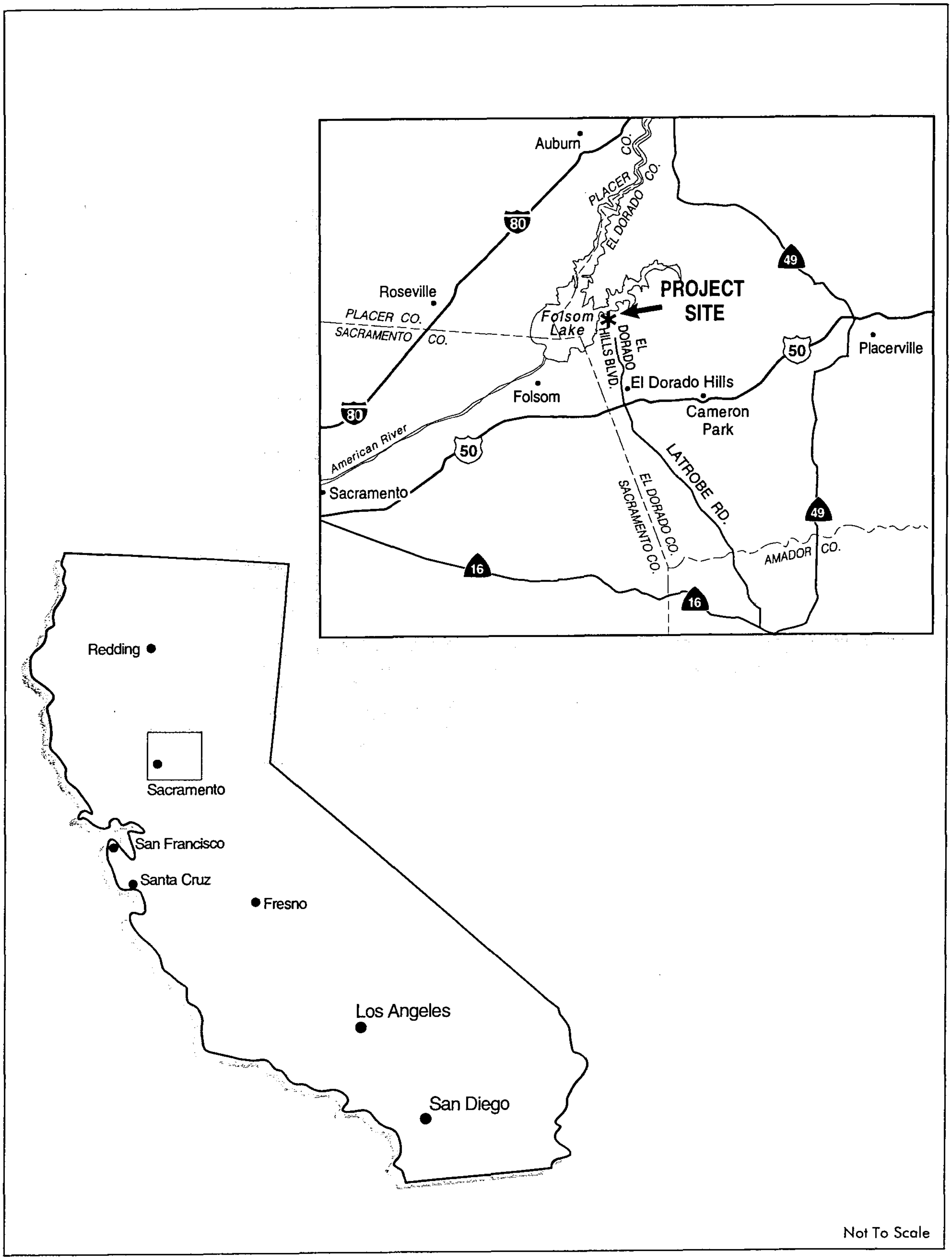


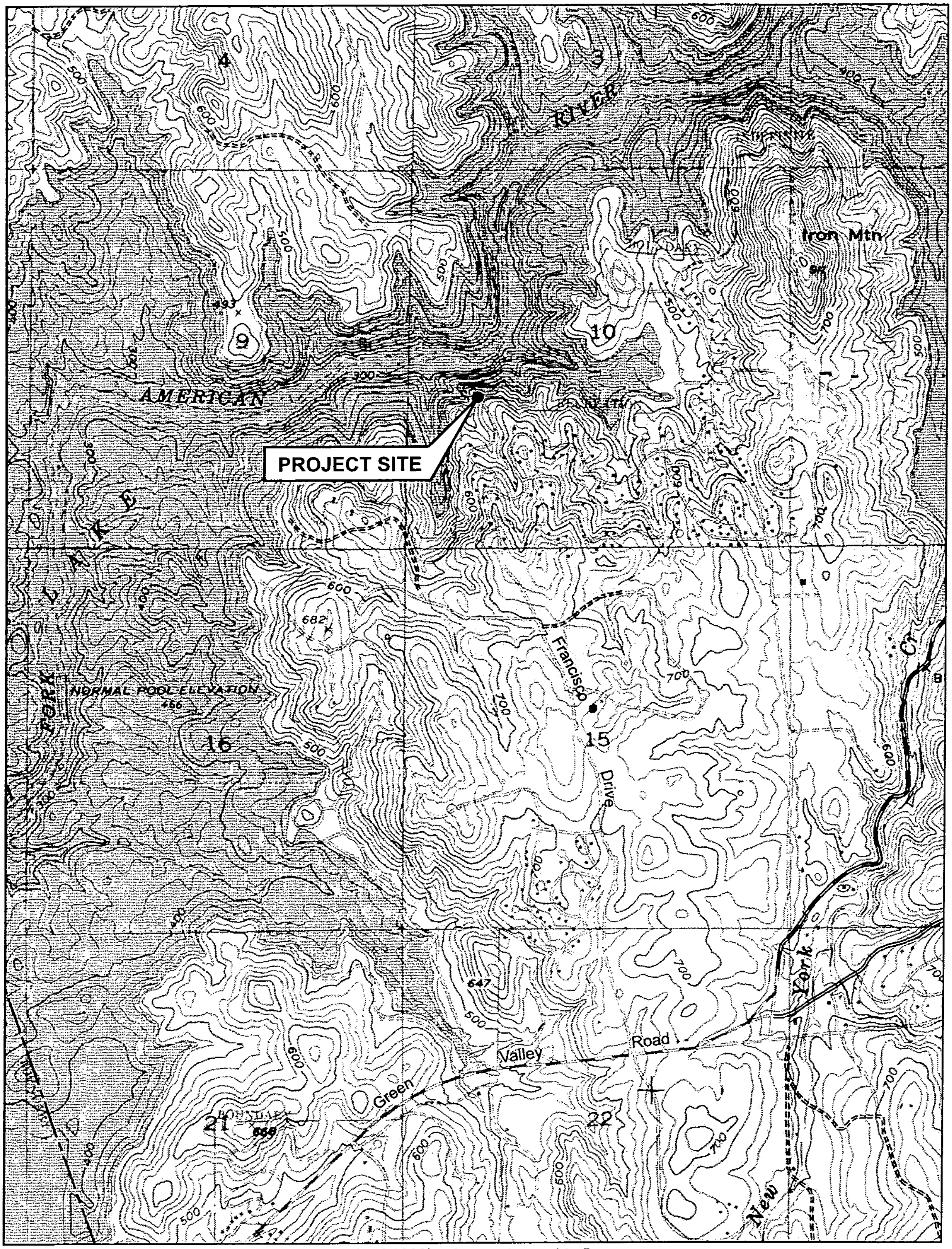
EXHIBIT 1

Regional Location Map

Folsom Reservoir Temperature Control Device
1T034.01 11/01

NORTH

EDAW



Source: USGS Clarksville Quad 1953 (photorevised 1980) -- Contour Interval 20 Feet

EXHIBIT 2

Project Location Map

Folsom Reservoir Temperature Control Device
1T034.01 11/01

0 .25 .5 MILES NORTH

EDAW

Concrete footings connected by angle bars railings would be installed at various locations along the trench to provide support to the structure. Up to 6 piles may be driven near the bottom of the lake to support the lower end of the structure.

Construction-related effects on the environment and costs associated with underwater trenching are minimized if construction occurs during low water levels. Trenching and project construction are planned for an approximate 5-month period during fall or winter, when reservoir levels would be reduced for flood control operation.

Two options for construction are being considered at this time. The first method of installation would be to transport the segments to the EID Raw Water Pump Station and bolt the segments together as they are slid down the excavated trench bank into Folsom Lake. A barge would be anchored in the lake to receive and support the downhill end of the structure and guide it into position. The underwater end of the structure would then be attached by divers to six steel piles that would have been previously driven into the bottom of the lake.

A second possible method of installation would be to bolt the structure together at a public ramp on the lake and float it over to the EID Raw Water Pump Station. Once at the Pump Station, a barge would direct the sinking of the structure into the correct position so it could be attached to the steel piles previously driven into the bottom of the lake. Buoys would be used around the construction area to prevent boating within the construction area.

3.1.2 MEASURES TO MINIMIZE EFFECTS

The following measures are incorporated into the proposed action to minimize effects on water quality:

- WQ-1. Excavation activities would occur during the period when Folsom Lake is at its lowest level during fall/winter. This would reduce the amount of excavation occurring under water and would help reduce the amount of sedimentation occurring in the reservoir near the project area.
- WQ-2. Excavation equipment would be closely examined for oil and fuel discharges and steam cleaned prior to use in the lake.
- WQ-3. All equipment operated within or adjacent to the lake would be checked and maintained daily to prevent leaks of materials that, if introduced to water, could be deleterious to aquatic life.
- WQ-4. Petroleum products, and other substances that could be hazardous to aquatic life and result from project related activities, would be used and stored at least 150 feet from the lake in order to reduce the potential for surface water contamination.
- WQ-5. Excavated materials that contain excessive fines would be removed and disposed of at a public landfill or county approved area.
- WQ-6. Staging/storage areas for equipment, materials, fuels, lubricants, and solvents would be located in the existing paved parking lots to reduce the potential for these materials getting into the surface water of the lake.
- WQ-7. Equipment would be moved out of the normal high water area for refueling and lubricating to reduce the potential for these materials getting into the surface water of the lake.
- WQ-8. Appropriate runoff controls such as berms, storm gates, detention basins, overflow collection areas, filtration systems, and/or sediment traps would be implemented to control siltation and the potential discharge of pollutants.
- WQ-9. Excavated soils would be stockpiled alongside the trench and covered with appropriate materials to prevent erosion and sedimentation into surface waters.

- WQ-10. Disturbed soils would be covered with riprap to prevent erosion into the lake during construction and areas above water levels would be re-vegetated with native grass species after construction.

If the excavator or hydro-hammers were unable to remove hard rock during the excavation process, explosives would be used to remove rock. The following measures would be incorporated into the proposed action to minimize or eliminate water quality effects from blasting:

- WQ-11. Excavation would occur during fall/winter when the reservoir is at its lowest level, which would reduce or eliminate the use of explosives used under water and reduce sediment suspension occurring in the water.
- WQ-12. Areas adjacent to the blasting would be covered with special mats that would reduce sedimentation to the water.

Since the Federal government owns land at the project site, Reclamation bears the responsibility for compliance with Section 106 of the National Historic Preservation Act. In the remote chance that any previously unidentified cultural resources are found during project construction, the proposed action incorporates the following features to protect such resources:

- CULTURAL-1. If archaeological, historical, or paleontological resources are encountered during any phase of construction, work in the area must halt and the Central California Area Office area manager must be notified. The Mid-Pacific Regional Archaeologist will, in turn, be notified to evaluate the find and determine if consultation is required with the State Historic Preservation Officer. Mitigation may be required, contingent upon the find, and can include avoidance, treatment, or preservation. If project plans are revised and require ground-disturbing activities outside the present scope of work, additional archaeological work may be required.
- CULTURAL-2. In the event that human remains are discovered at any time during construction, then all activities in the vicinity of the find must halt and the contractor must provide immediate telephone notification of the inadvertent discovery to the Reclamation archaeologist at (916) 978-5040 or (916) 978-5041. Work will stop until Reclamation archaeologists are able to assess the situation onsite. This action must promptly be followed by written confirmation to the responsible Federal agency official with respect to an inadvertent discovery on Federal lands. Reclamation archaeologists will follow the implementing regulations (43CFR10) for the Native American Graves Protection and Repatriation Act (P.L.101-60) of November 1990.

The proposed action incorporates features to minimize air quality effects. Compliance with applicable El Dorado County APCD rules, including Rule 223 regarding fugitive dust, will be adhered to during the construction of the proposed action. To reduce fugitive dust emissions, in compliance with APCD Rule 223, the following measures are incorporated into the project action:

- AQ-1. Water would be applied by means of truck(s), hoses and/or sprinklers prior to any land clearing or earth movement to minimize dust emissions.
- AQ-2. Haul vehicles transporting soil into or out of the property would be covered.
- AQ-3. All visibly dry disturbed soil surface areas of operation would be watered to minimize dust emissions.
- AQ-4. Paved roads would be cleaned if the amount of dirt tracked-out of the operation area has the potential to cause dust emissions.
- AQ-5. All visibly dry disturbed unpaved driveway surface areas of operation would be watered to minimize dust emissions.

- AQ-6. Vehicles entering or exiting the construction area shall travel at a speed which minimizes dust emissions.
- AQ-7. Construction workers would park in designated parking area(s) to help reduce dust emissions.
- AQ-8. Soil pile surfaces shall be moistened if dust is being emitted from the pile(s). Adequately secured tarps, plastic or other material may be required to further reduce dust emissions.

The proposed action also incorporates a measure to minimize effects from any asbestiform-containing soils that may be encountered, although none are expected to occur. In the event asbestiform containing soils are suspected or identified during construction, the El Dorado County APCD shall be notified immediately, and Asbestos Hazard Dust Mitigation measures shall be implemented immediately to minimize and control potential asbestos dust emissions, as recommended by the El Dorado County APCD.

The following measures are incorporated into the proposed action to minimize construction-related noise:

- NOISE-1. Construction operations involved with the proposed action would be limited to the hours between 7:00 a.m. and 7:00 p.m.
- NOISE-2. To the extent feasible, construction equipment would be properly equipped and maintained with noise reduction devices, such as mufflers, in accordance with manufacturers' specification to minimize construction generated noise, and all internal combustion engines shall be operated with exhaust and intake silencers.
- NOISE-3. Blasting or pile driving will be curtailed whenever any bald eagles are in the immediate vicinity of the construction site.

3.1.3 Operation and Maintenance

The TCD is very simple to operate and maintain. A temperature probe allows the temperature of the surrounding water at each of the five gates to be determined. EID will operate the TCD such that the coldwater pool is avoided, and warmer water higher in the water column is extracted. If poorer water quality becomes an issue at higher levels, such as during an algal bloom, the water can be mixed with water lower in the water column to ensure proper drinking water taste.

Maintenance of the TCD is simple and consists of periodic checks of all gates to ensure their proper functioning.

3.2 Alternatives

3.2.1 No-Action Alternative

If the structure is not installed, EID would continue to extract its water entitlement from the cold water pool in Folsom Lake, the quantity of which would not be available to Reclamation to release down the lower American River for the benefit of salmon and steelhead.

3.2.2 Alternatives Considered but Eliminated from Further Analysis

Reclamation's Technical Services Center in Denver, Colorado, conducted a Value Planning Study to evaluate alternative designs to meet the project purpose and need (USBR 2001). The proposed action contains features identified during the study to optimize efficiency, reduce costs, and minimize environmental impact. All feasible designs have essentially the same environmental impact characteristics as described for the proposed action.

During the study, several alternative concepts were identified, but not considered feasible for reasons of cost of operational considerations, and therefore eliminated from further analysis. These included suspending an intake from a barge, building a neutrally buoyant inlet 20 feet below the surface, and using a flexible inlet pipe that could be moved up and down a rail.

4 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The following issue areas were eliminated from further analysis because the proposed action and alternatives have no environmental effects related to these resource areas:

- Agricultural Resources,
- Land Use,
- Mineral Resources,
- Energy and Power Supply,
- Water Supply and Flood Control,
- Public Health and Hazards, and
- Public Services

4.1 PROPOSED ACTION

4.1.1 HYDROLOGY

The American River watershed covers approximately 1,895 square miles. Its headwaters originate in the Sierra Nevada, flowing west through the foothills into the Sacramento Valley and terminating at the confluence with the Sacramento River. The American River system consists of the North, Middle, and South forks that drain the upper watershed, Folsom Dam and Reservoir, Lake Natoma and Nimbus Dam, the Folsom South Canal, and the lower American River.

FOLSOM LAKE AND LAKE NATOMA

Folsom Lake has a maximum storage capacity of approximately 977,000 AF and a maximum depth of approximately 266 feet. Folsom Lake completely regulates flow into the lower American River during most of the year. The lake can fill during winter storms or during spring snowmelt, with lake elevations declining throughout the summer and fall when outflows to the lower American River exceed inflows. Its capacity is only about 42% of its average annual inflow so spills in winter or spring are fairly common. Although snowfall is the primary form of precipitation at elevations above 6,000 feet, rainfall is responsible for approximately two-thirds of the flow into Folsom Lake. The average annual runoff into Folsom Lake is approximately 2.6 million AF.

Folsom Lake storage has multiple uses. The authorizing legislation for constructing Folsom Dam and Reservoir, Public Law 81-356, directed Reclamation to operate the dam to control floods, provide for storage and delivery of water, generate power, and provide salinity control in the Delta. As an integrated part of the federal Central Valley Project (CVP), Folsom Dam is operated not only for flood control and to meet CVP water delivery obligations, but also to satisfy instream-flow needs in the lower American River. Reclamation operates Folsom Dam to meet the objectives and environmental obligations of the San Francisco Bay-Sacramento-San Joaquin River Delta Estuary (Bay-Delta) Water Quality Control Plan (WQCP), the biological opinions for winter-run chinook salmon, delta smelt, and splittail, and the implementation of the Central Valley Project Improvement Act (CVPIA).

Folsom Lake maintains both cold- and warm-water fisheries and is a popular regional recreation site, with camping, boating, and fishing being primary recreational uses. Numerous local irrigation districts obtain water supplies directly from Folsom Lake; EID, the City of Roseville, San Juan Water District, California State Prison, and the City of Folsom divert water directly from Folsom Lake. Folsom Lake releases into the lower American River are used by many recreationalists; are important to maintain salmon, steelhead, American shad, and striped bass populations in the river; and are used by Reclamation to provide a major water supply source for agricultural and urban contractors, as well as to maintain water quality in the Sacramento-San Joaquin River Delta (Delta). Nimbus Dam is 7 miles downstream of Folsom Dam and forms Lake Natoma, a re-regulating reservoir for releases from Folsom Reservoir.

LOWER AMERICAN RIVER

The lower American River consists of a 23-mile reach between Nimbus Dam and the Sacramento River. Flows are highest during winter storms and during spring snowmelt. Flows during the summer and fall are enhanced over natural flows as Reclamation provides flows for downstream water users and the environment. The lower American River historically accounts for approximately 15 percent of the Sacramento River flows.

Minimum fishery releases to the lower American River from Nimbus Dam are prescribed in State Water Resources Control Board Water Rights Decision 893 (D-893). Recognizing that these minimum flows are inadequate to support aquatic resources, Reclamation voluntarily operated Folsom and Nimbus dams to meet a modified D-1400 for minimum fishery flows, and more recently has been striving to meet the Anadromous Fish Restoration Program (AFRP) objectives. Reclamation adaptively manages the water temperature and flows in the river, including the blending of water from the coldwater pool with warmer water to meet downstream objectives while conserving cold water for later use.

EID FACILITIES AND OPERATIONS

EID operates a complex, interconnected system of diversion and conveyance facilities. Waters originating from the South Fork American River and upstream tributaries and reservoirs are diverted or rediverted into Pacific Gas & Electric Company's (PG&E's) El Dorado Canal. EID also diverts water from the North Fork Cosumnes River and Clear Creek. EID has a contractual entitlement to divert up to 7,550 AF/year of water from Folsom Lake. The water is withdrawn from Folsom Lake at EID's Pump Station.

ENVIRONMENTAL CONSEQUENCES

Because the TCD would not affect the quantity and timing of EID's diversions, there will be no change in Folsom Lake water levels, flow volumes or timing of releases into the lower American River. The proposed action only affects the volume of cold water in Folsom Reservoir that could be released to the lower American River (see "Water Quality" below). The proposed action does not increase EID's entitlement or otherwise increase the amount of water that is extracted from Folsom Reservoir. Hydrologic conditions would be the same with or without the proposed action.

4.1.2 WATER QUALITY

Folsom Lake and releases into the lower American River are used, among other things, for human water supplies and fisheries maintenance. The following existing and potential beneficial uses have been defined by the Central Valley Regional Water Quality Control Board (RWQCB) for Folsom Reservoir (Central Valley Regional Water Quality Control Board 1994): municipal, domestic, and industrial water supply; irrigation; power; water contact and non-contact recreation; warm and cold freshwater habitat; warm freshwater spawning habitat; and wildlife habitat. Beneficial uses of the lower American River include all of those listed above, as well as recreational boating and rafting, warm and coldwater fish migration habitat, and coldwater spawning habitat (Central Valley Regional Water Quality Control Board 1994).

Water quality in Folsom Lake is generally acceptable for the beneficial uses currently defined for it. Temperature, dissolved oxygen, conductivity, and toxic metals concentrations have been below recommended limits. Taste and odor problems, however, have occurred in municipal water supplies diverted from Folsom Lake in the past, which were attributed to blue-green algae blooms that occasionally occur in the lake as a result of elevated water temperatures, primarily during late summer. The coldwater pool in Folsom Reservoir is critical for managing water temperatures in the lower American River to maintain and enhance salmon and steelhead production. With the exception of water temperature, water quality parameters for the lower American River have typically been well within acceptable limits to achieve water quality objectives and beneficial uses identified for this water body.

CONSTRUCTION-RELATED CONSEQUENCES

Constructing EID's TCD could potentially affect the quality of water in the immediate area of Folsom Lake through sedimentation and contamination. Sedimentation could be caused by eroded material and runoff from the site that drains into the lake and is suspended in the surface water. Contamination could emanate from excavation and construction equipment and materials used by this equipment that enters surface water and degrades water quality. Some minor effects could be expected within approximately 150 feet of the construction site within Folsom Lake. These effects on lake water quality are considered to be minimal, however, because the proposed action incorporates best management practices and measures that protect water quality.

OPERATIONS-RELATED CONSEQUENCES

The proposed action would allow up to 7,550 AF/year to be withdrawn from upper levels of Folsom Lake as compared to taking a large portion of this water from the coldwater pool. Consequently, the coldwater pool would be that much larger and be available to provide an incremental benefit to anadromous fish in the lower American River when this increment of water is released. In essence, up to 7,550 AF/year of warmer water would be diverted by EID rather than cold water, while up to 7,550 AF/year of colder water would remain in the coldwater pool. It is important to note that the overall volume of water does not change, but only the volume of coldwater pool that remains available for downstream releases.

The proposed action would result in EID diversions of warmer water as compared to colder water. During most times, this affect would be unnoticed to EID water supply consumers. EID diverted water in summer 2001 at temperatures as warm as 75° F without any apparent complaints from customers. If any taste and odor problems materialize, however, EID can operate the various gates on the TCD and keep any noticeable taste and odor effects within acceptable levels, while still providing more protection to the coldwater pool than exists under the No Action Alternative.

4.1.3 FISHERIES RESOURCES

The warm epilimnion of Folsom Lake provides habitat for warm-water fishes, whereas the reservoir's lower metalimnion and hypolimnion form a "coldwater pool" that provides habitat for coldwater fish species throughout the summer and fall portions of the year. Hence, Folsom Lake supports a "two-story" fishery during the stratified portion of the year, with warm-water species using the upper, warm-water layer and coldwater species using the deeper, colder portion of the lake. Black bass, sunfish, and catfish constitute the primary warm-water sport fisheries of Folsom Lake. The Lake's coldwater sport species include rainbow and brown trout, and chinook salmon (stocked). The primary spawning period for warm-water fish in Folsom Lake is March through July. Coldwater species typically spawn in spring (rainbow trout) or fall (brown trout and Kokanee salmon) in tributaries to Folsom Lake.

Folsom Lake's coldwater pool is important not only to the lake's coldwater fish species during the summer months, but is also important to lower American River fall-run chinook salmon and steelhead. Seasonal releases from the lake's coldwater pool provide thermal conditions in the lower American River that support annual in-river and hatchery production of these salmonid species. Folsom Lake's annual coldwater pool volume is not sufficiently large to facilitate coldwater releases during the warmest months (i.e., July through September) to provide maximum thermal benefits to lower American River steelhead and coldwater releases during October and November that maximally benefit fall-run chinook salmon migration, spawning, and incubation. The primary factor limiting fall-run chinook salmon and steelhead production within the lower American River is believed to be high water temperatures. High water temperatures during the fall can delay the onset of spawning by chinook salmon, and river water temperatures can become unsuitably high for any juvenile salmon rearing during late spring and steelhead rearing during summer.

CONSTRUCTION-RELATED CONSEQUENCES

Construction activities for the TCD will not adversely affect listed fish species because there are no federal- or state-listed fish species in Folsom Reservoir. Chinook salmon have been planted in Folsom Reservoir as part of DFG's Inland Salmon Program, but Folsom Lake is not designated critical habitat and chinook salmon planted in Folsom Lake are not part of the protected Ecological Significant Unit (ESU). Construction activities will have minor effects on fish in the immediate vicinity of the activities, but any such fish are mobile enough to locate to other areas during construction. Construction activities in late fall are outside of the spawning activities for Folsom Lake fishes and, therefore, will not disrupt any spawning activities. The steep bank located at the project site is not conducive for fish spawning. The project site is not a sensitive habitat for any Folsom Lake fish species.

Construction activities for the TCD could cause mortality to any fish immediately at or adjacent to the project site if explosives need to be used. (If the excavator or hydro-hammers are unable to remove hard rock during the excavation process, explosives would need to be used to remove rock.) The distance at which fish would be killed is determined by the size of the explosive and the distance the pressure wave travels in water. The vibrations caused by any explosives used under and/or above the water at Folsom Reservoir could kill fish in the immediate vicinity (within approximately 25-75 feet) of the explosion. This effect would be very localized and would not substantially affect overall fish populations in Folsom Lake. The proposed action is designed to minimize the amount of in-water work and blasting that would potentially occur, and includes covering the area of any needed blasting with special mats that would absorb much of the impact. In addition, if any blasting is needed, the smallest necessary explosive to remove rock would be used. Consequently, effects on fish populations would be very localized and minimal.

Construction activities for the TCD would have no effect on fish species below Folsom Dam because only the localized area near the pump station at Folsom Lake will be affected. The flow rate and temperature of water being released from Folsom Dam would remain unchanged due to construction activities.

Prior to working in Folsom Lake, CDFG would be consulted for a Lakebed Alteration Agreement, pursuant to Section 1601 of the Fish and Game Code of California. Excavation and construction activities would be conducted according to the guidelines and restrictions set forth by CDFG in the Lakebed Alteration Agreement.

OPERATIONS-RELATED CONSEQUENCES

Operation of the TCD would not have any measurable impact on Folsom Lake fisheries. The gates would be screened so impacts to fish would be minimized. Water intake velocities would not exceed two feet per second. The change in volume between coldwater and warm-water pools would not have any measurable or significant affect on Folsom Lake fisheries.

The proposed action would allow a larger coldwater pool to exist in Folsom Lake. This increase in cold water would be beneficial to fall-run chinook salmon and steelhead in the lower American River. The purpose of this project is to conserve the coldwater pool for subsequent release into the lower American River to benefit anadromous fish. While only a small part of the maximum coldwater pool storage volume, the increment of coldwater storage that the proposed action would allow is important because of the major effect that Folsom Lake release temperatures have on salmon and steelhead. The amount of conserved coldwater pool resulting from the proposed action would vary annually but typically be approximately 6,000 AF/year. The amount saved is less than the total EID entitlement of 7,550 AF/year because water diverted in winter months does not benefit the coldwater pool.

4.1.4 BOTANICAL AND WILDLIFE RESOURCES

An EDAW biologist conducted a site visit on October 31, 2001 to evaluate the biological resources on the project site. The majority of the project site consists of approximately 3,000 square feet of unvegetated Folsom Lake bank, which is covered with riprap. A narrow (approximately 5 feet) band of scrub vegetation occurs on the site between the ordinary high water mark of the lake and the existing pumping facility. Shrub species include coyote brush (*Baccharis pilularis*) and sage (*Salvia sp.*). A few weedy plants, such as canarygrass (*Phalaris sp.*), brome (*Bromus sp.*), and curly dock (*Rumex crispus*), were also present. The area surrounding the project site is characterized as blue oak (*Quercus douglasii*)-foothill pine (*Pinus sabiniana*) woodland. No tree species are present on the project site.

CDFG's California Natural Diversity Database (CNDDB 2001) was reviewed for sensitive biological resources, including sensitive habitats and special-status species that are known to occur in the vicinity of the project site. Special status species include plants and animals listed as state and/or federally Threatened or Endangered, considered candidates for listing as Threatened or Endangered, identified by CDFG and/or U.S. Fish and Wildlife Service (USFWS) as Species of Special Concern, or considered to be rare, threatened or endangered by the California Native Plant Society (CNPS). Sensitive natural communities include those that are especially diverse, regionally uncommon, or of special concern to local, state, and federal agencies. CNDDB record search results are provided in Appendix A.

SPECIAL-STATUS PLANTS

A number of special-status plant species in the area of the project site are documented in the CNDDB (2001). However, these species are restricted to habitats that are not present on the project site. Nearly all of the area to be disturbed is located within a typically submerged area of Folsom Lake. During a site visit in November 2001, no special-status plants were observed, and special-status plants are not expected to occur because of the disturbed nature of the project site.

SPECIAL-STATUS WILDLIFE

Several special-status wildlife species are known to occur in the vicinity of the project area (CNDDB 2001). Five of the species, vernal pool fairy shrimp (*Branchinecta lynchi*), valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), great-blue heron (*Ardea herodias*), great egret (*Ardea alba*), and tricolored blackbird (*Agelaius tricolor*), are restricted to habitats that are not present on the project site. Therefore, these species are unlikely to occur on the project site are not expected to be affected by the project. Bald eagle (*Haliaeetus leucocephalus*) and northwestern pond turtle (*Clemmys marmorata marmorata*) are also not expected to occur on the project site, because the habitat on-site is not suitable to support these species.

No vernal pools or ephemeral ponds are present on or adjacent to the project site; thus no suitable habitat is present for vernal pool fairy shrimp. Valley elderberry longhorn beetle is restricted to elderberry shrubs, which are not present in the project area. Suitable trees for heron and egret rookeries do not occur on or adjacent to the site. The project site does not contain dense marsh vegetation required for nesting by tricolored blackbirds.

Bald eagles are seldom observed at or near the project site. Bald eagles have been observed wintering approximately five miles from the project site on Bass Lake for the past 40 years. They are not expected to occur on the project site, which is unvegetated, because it does not contain nesting or foraging habitat. However, bald eagles may forage in the project vicinity in Folsom Lake. Foraging habitat for bald eagles may be temporarily reduced during construction, but this would have no adverse affect because of the abundance of other foraging habitat in the immediate vicinity and it is a very localized effect, both temporally and spatially. In the unexpected event that any bald eagle is in the immediate vicinity of the construction site, blasting or pile driving will be curtailed.

Northwestern pond turtles were recorded approximately five miles south of Folsom Lake in Carson Creek. Pond turtles usually occur in slow-moving or shallow bodies of water, which typically have a soft or rocky bottom and are surrounded by aquatic vegetation. Because the bank of Folsom Lake is very steep and unvegetated at the project site, pond turtles are not expected to occur on the project site.

4.1.5 VISUAL RESOURCES

Folsom Lake represents a significant visual component that contrasts sharply with the nearby foothill landscape, creating a vivid landscape feature. Folsom Lake levels are drawn down as summer progresses, creating a ring of bare soil along the lake's high water mark. This ring represents a dominant negative visual feature, affecting the overall visual quality of the area that is accentuated in dry years. Generally, Folsom Lake is located with a landscape of rolling wooded foothills and provides a pleasing visual setting for numerous recreational uses.

Views of the project site would be limited to the immediate project vicinity. The TCD would not be readily visible to visitors on Folsom Lake because the majority of the device above the surface of the water would be buried in the bank of Folsom Lake on EID property. The temperature control device would create a visual character on the project site that is essentially the same as the existing on-site visual character. In addition, the proposed action would not alter any views in the area of sensitive viewpoints or scenic vistas located within the immediate project vicinity. The only potential impact would be associated with construction activities.

During construction, a barge would be anchored in the lake resulting in a temporary potential change in the visual character of the project vicinity. However, this potential change would be temporary. No substantial degradation of the existing visual character of the site would occur because the vicinity is already developed to a comparable density, construction activities would be temporary up to approximately 5 months in duration, and construction would occur during "off-peak" visitation. Therefore, effects to aesthetics are considered to be minor.

4.1.6 RECREATION RESOURCES

Folsom Lake is a State Recreation Area that serves the greater Sacramento area for summer recreation in the form of camping, hiking, biking, boating, and other outdoor recreation activities. The California Department of Parks and Recreation manages the Folsom Reservoir State Recreation Area which includes Folsom Lake and the surrounding facilities. The Lake features approximately 75 miles of shoreline and 80 miles of trails which provide opportunities for hiking, horseback riding, nature studies, camping, and picnicking. There are seven major recreation areas with facilities located around the lake. The Folsom Reservoir State Recreation Area, including Folsom Lake, is one of the most heavily used recreational facilities in the State Park system, with two to three million visitor days per year. Season and reservoir levels have substantial effects on recreation usage with most recreation usage occurring during May through August and when reservoir levels are high.

The proposed action would have no direct effect on recreation. The construction would be performed in fall or winter, when recreational use at the lake is decreased. The proposed action would not affect reservoir water levels or any other parameters that would affect recreation use. The only indirect effect on recreation would occur through the minor effects to visual resources during construction. These effects are considered to be minor.

4.1.7 CULTURAL RESOURCES

NEPA and Section 106 of the National Historic Preservation Act require federal and state agencies to consider the potential project effects of their undertakings on significant cultural resources. Significant cultural resources are those sites, districts, buildings, structures, and objects that are important in American history, architecture, archaeology, engineering, or culture. These resources are listed, or are eligible for listing, in the National Register of Historic Places (National Register).

The Native American Heritage Commission (NAHC) and local Native Americans were contacted to seek their knowledge of or interest in cultural resources associated with the project site. These contacts are intended to solicit input on potential concerns with or interests in the planned undertaking, in accordance with guidance provided by the Advisory Council on Historic Preservation for the implementation of Section 106 (36 CFR Part 800). No responses have been received.

A record search was conducted at the North Central Information Center (NCIC) covering an area within a 0.5-mile radius of the project site. The record search involved examination of maps and submissions from previous surveys within the vicinity of the project area. Three previous cultural resources surveys have been performed north and west of the current project area. One prehistoric site, CA-ELD-260, has been noted approximately 0.5 mile west of the project area. The NCIC search also included examination of background historic resources including:

- OHP Historic Property Directory,
- NCIC Historic Resources Map,
- California Inventory (1996), and
- 1856 GLO Plat Map for Township 9 North, Range 8 East, California Historic Landmarks (1996).

While a total of 157 archaeological sites have been recorded within or immediately adjacent to Folsom Reservoir, none of these resources cited above listed any properties within the specific project area to be affected by the proposed action.

The project area itself consists of a paved parking area and the steep reservoir embankment, covered with riprap. All project disturbances would be confined to these areas. Given available information collected to date, there would be no effect on cultural resources. In the remote chance that any previously unidentified cultural resources are found during project construction, the proposed action incorporates features to protect such resources.

4.1.8 TRAFFIC

The delivery of the 40-foot segments of the structure would require about six truck round trips from the originating destination to the project site. There would also be traffic from the crews working on the proposed action over a period of 3 to 4 weeks. The pump station is accessible from Planeta Way north of Guadelupe Drive and immediately east of the north end of Francisco Drive. The increase in traffic would be minor and temporary, therefore having a minor overall effect.

If a barge is used to float the structure to the site, there would be increased traffic at Browns' Ravine Marina, the closest boat marina. The impact on traffic would be minor and temporary.

4.1.9 AIR QUALITY

Construction activities could result in short-term construction-generated fugitive dust that could exceed the significant recommended thresholds of the El Dorado County Air Pollution District. Short-term construction would temporarily generate fugitive dust due to machinery and motor vehicles associated with the construction worker trips and other construction-related activities. Construction-generated fugitive dust is described as "short-term," since the fugitive dust is limited to the length of the construction period. The proposed action incorporates features to minimize air quality effects.

El Dorado County is located in the foothills of the Sierra Nevada Mountain Range where naturally occurring asbestos is present in surface deposits of ultramafic rock (serpentinite). According to the California Department of Conservation, Division of Mines and Geology, the proposed project site is located in an area that is described as "an undesignated map area that probably does not contain asbestos." If asbestos contaminants are found in the soils of the project during construction, airborne entrainment of asbestos may occur from the disturbance of ultramafic rock due to construction operations such as grading or excavating. Asbestos is listed as a Toxic Air Contaminant (TAC) by CARB and as a Hazardous Air Pollutant (HAP) by the U.S. Environmental Protection Agency (EPA). The risk of disease is dependent upon the intensity and duration of exposure. Asbestos fibers when inhaled may remain in the lungs and are linked to such diseases as asbestosis, lung cancer, and mesothelioma (CARB 2001). The proposed action incorporates features to minimize effects in the event that asbestiform-containing soils are suspected or identified during construction.

4.1.10 NOISE

As analyzed below, short-term onsite construction operations could potentially result in noise levels that exceed the El Dorado County Noise Ordinance Standards at the nearest sensitive receptor if operations occurred during the more noise-sensitive periods of the day (e.g., evening and night-time hours). However, construction operations would be limited to 8 a.m. to 5 p.m. to avoid noise-sensitive periods. Additionally, short-term offsite traffic involving haul truck trips may potentially result in a noticeable increase in traffic noise levels due to the increase in traffic volume over the 5-month construction period.

The onsite construction equipment would be anticipated to include one 35-ton crane, one excavator, dump trucks, one dozer, and possibly one water truck. Noise generated by construction equipment associated with earth moving and material-handling operations can reach high levels. The U.S. Environmental

Protection Agency has found that the noisiest equipment types operating at construction sites typically range from 88 dBA L_{eq} to 91 dBA L_{eq} at 50 feet. Typical operating cycles may involve 2 minutes of full power, followed by 3 or 4 minutes at lower settings. Assuming all pertinent equipment is present and operating simultaneously, average noise levels associated with grading and excavation construction operations typically range from approximately 83 dBA L_{eq} to 89 dBA L_{eq} (U.S. Environmental Protection Agency 1971). Table 1 presents the noise levels typically generated by construction equipment at a distance of 50 feet.

Simultaneous operation of the onsite construction equipment associated with the proposed project as identified above would be expected to result in a maximum average noise level of approximately 92.4 dBA at 50 feet from the project site, which exceeds the standards outlined in Table 1. The closest residences to the construction site are located on Planeta Way and are approximately 1,500 feet away. Residents may be able to hear the construction activity, but it would be temporary and likely masked by the background noise from Planeta Way and Francisco Avenue. The proposed action has incorporated features to minimize the effects of temporary construction activities.

Table 1. Typical Construction Equipment Noise Levels

Equipment	Typical Noise Level (dBA) 50 ft from Source
Air Compressor	81
Backhoe	80
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Generator	81
Impact Wrench	85
Jack Hammer	88
Loader	85
Pile Driver (Impact)	101
Pile Driver (Sonic)	96
Pneumatic Tool	85
Pump	76
Rock Drill	98
Saw	76
Shovel	82
Truck	88
Source: Federal Transit Administration 1995	

The proposed action does not include the construction or long-term operation of any structures that would permanently increase ambient noise levels in the project vicinity above levels existing without the project. Thus, with respect to long-term effects, the proposed action would result in no effect.

VIBRATION

Construction activities can result in varying degrees of ground vibration, depending on the equipment used and activities being performed. Ground vibration generated by construction equipment spreads through the ground and diminishes in strength with distance. The effects of ground vibration can vary from no perceptible effects at the lowest levels, low rumbling sounds and detectable vibrations at moderate levels, and slight damage to nearby structures at the highest levels. At the highest levels of vibration, damage to structures is primarily architectural (e.g., loosening and cracking of plaster or stucco coatings) and rarely result in structural damage. The ground vibration levels associated with various construction equipment are depicted in Table 2. Vibration levels associated with blasting activities can range depending on the weight of the charge, geologic characteristics, time delay between sequential detonations, and distance to the source. Typical blasting vibration particle velocities have been measured at between 0.26 and 0.5 inches/second at approximately 260 feet and between 0.09 and 0.13 inches/second at 400 feet, based on a 4 pound detonation charge. (U.S. Department of the Army, 1989).

Table 2. Representative Vibration Source Levels for Construction Equipment

Equipment		Peak Particle Velocity at 25 feet (in/sec)
Pile Driver (impact)	upper range	1.518
	typical	0.644
Pile Driver (sonic)	upper range	0.734
	typical	0.170
Large Bulldozer		0.089
Caisson Drilling		0.089
Loaded Trucks		0.076
Jackhammer		0.035
Small Bulldozer		0.003
Source: U.S. Department of Transportation, 1995		

At the request of the U.S. Environmental Protection Agency, the Committee of Hearing, Bio-Acoustics, and Bio-Mechanics (CHABA) has developed guidelines for safe vibration limits for ancient and/or historic buildings. For fragile structures, the CHABA recommends a maximum limit of 0.25 inch per second peak particle velocity (ppv) (U.S. Department of Transportation, 1995). In addition, the U.S. Bureau of Mines has set a safe limit of 0.5 inch per second ppv to avoid structure damage in residential structures. For most structures, a peak particle velocity threshold of 0.5 inch per second is sufficient to avoid structure damage, with the exception of fragile historic structures. For the protection of fragile, historic, and residential structures, the California Department of Transportation recommends a more conservative threshold of 0.2 inch per second ppv (Caltrans, 1996).

The proposed project may involve the use of equipment and/or other construction-related processes, such as blasting, that could generate increased levels of ground vibration that may be detectable at nearby residences for brief periods of time. However, based on the vibration levels discussed above, predicted vibration levels would not be anticipated to exceed the threshold of 0.5 inch per second ppv at the nearest residential structure, which is located approximately 1,500 feet from the project site. The distance to the nearest residence attenuates the construction-related vibrations substantially. No historic structures are located within the project area that would be anticipated to be affected. As a result, increased vibration levels associated with the proposed construction activities would be minimal.

4.1.11 GEOLOGY AND SOILS

The project site is located within the western foothills of the Sierra Nevada Mountain Range. This northwest trending range extends from the Mojave Desert to the Modoc Plateau. Bedrock varies from Paleozoic age metamorphic to Holocene age sedimentary and volcanic rock. The dominant rock types are granitic and form the great Sierra Nevada Batholith.

Based on the geotechnical report prepared by Herzog Associates, the soil at the project site is Auburn Very Rocky Silt Loam. Meta volcanic bedrock underlies the surface soils (Herzog Associates 1989).

The potentially active Mesozoic-age Bear Mountain and Melones fault zones are approximately one mile and 16 miles east of the project site, respectively. Collectively, these faults are included within the foothill fault systems. The active Calaveras, Hayward, and San Andreas faults are located approximately 84, 90, and 102 miles to southwest of the site, respectively.

FAULTS

Fault rupture can occur along fault systems during seismic events (earthquakes). If the rupture extends to the surface, movement on a fault is visible as a surface rupture. The occurrence of fault rupture depends on several factors including location of the epicenter in relation to the project site and the characteristics of the earthquake, such as intensity and duration. The hazards associated with fault rupture generally occur in the immediate vicinity of the fault system.

The project site is not located within any fault zone of the Alquist-Priolo Earthquake Faulting Zoning Map issued by the California Department of Conservation, Division of Mines and Geology (CDMG 1992). No active faults or splays were identified onsite or in the project vicinity that could expose people or structures to hazards associated with fault rupture. Therefore, no impacts related to fault rupture would be anticipated.

EARTHQUAKES

Strong earthquakes generated along a fault system generally create ground shaking, which attenuates with distance from the epicenter. In general, the area affected by strong ground shaking will depend on the characteristics of the earthquake such as intensity and duration and the location of the epicenter from the project site.

As described above, no active faults or splays were identified onsite. However, the probability for severe ground shaking is moderate from earthquakes on regional faults outside the immediate vicinity.

Project-related structures would be designed in accordance with the California Health and Safety Code. This code requires that structures be designed to resist stresses developed by earthquakes. Accepted seismic design criteria are presented in the Uniform Building Code (UBC), Chapter 16, Division III. Division III provides the design specifications for resisting the effects of seismic ground motions; included in this Division are the following: engineering standards for minimum design lateral forces and related effects (e.g., the design for the shear forces at the base of structures, vertical distribution of force, and horizontal distribution of shear) (§1628); dynamic lateral-force procedures (§1629); lateral force on elements of structures, nonstructural components, and equipment supported by structures (§1630); detail systems design requirements (§1631); and non-building structures (§1632).

Project-related structures would be designed in accordance to the design factors identified in the UBC, at a minimum. Because the project would be designed in accordance with applicable state and federal standards, potential impacts related to seismic events would not be anticipated.

LIQUIFACTION

Primary factors in determining the liquefaction potential are soil type, the level and duration of seismic ground motions, the type and consistency of soils, and the depth to groundwater. The project site is located in an area identified as having a low liquefaction potential (Herzog Associates 1989).

Seismically-induced ground subsidence is typically due to densification of subsurface soils during, and immediately following, a seismic event. Generally, loose or granular uniformly graded soils would be the most susceptible to densification, resulting in ground failure. Based on the subsurface conditions present onsite, the potential for ground failure is relatively minor due to the absence of loose or granular, deep uniform soils. Therefore, no impacts related to ground failure, including liquefaction, would be expected to occur with the proposed action.

LANDSLIDES

The project would involve the construction of the TCD, a steel box structure partially buried in the bank of the lake. Because the project site is located on steeply sloping lands and would require cuts of up to 7 feet deep, it could be subject to landslides. However, the project would be designed in accordance to State and Federal standards for soil erosion and landslides and therefore the potential for landslides associated with the proposed action would not be anticipated.

SOIL DISTURBANCE

Construction of the project would require trenching, excavation, and placement of fill materials during project construction. Activities would result in minor alterations to surface topography and soil disturbance thereby increasing the potential for soil erosion associated with loose or uncompacted fill materials. However, the project would be constructed in accordance with standard conditions and specifications to minimize erosion and loss of topsoil. Therefore, this would be a minor impact.

The preliminary soil-mapping unit delineated on the project site does not contain collapsible or expansive soil properties such as deep, uniformly graded materials that could result in a risk to life or property. This project would be constructed in accordance with standard conditions and specifications to minimize damage from collapsible or expansive soils (Herzog Associates 1989).

4.1.12 HAZARDOUS MATERIALS

The proposed action does not include any routine transport, use, or disposal of hazardous material. Although hazardous materials such as fuel would be present onsite during construction, this would be temporary. Therefore, the effects related to creation of significant hazards to the public through routine transport, use, and disposal of hazardous materials would be minor. Any hazardous materials used on site, such as fuels, will be transported, used, and disposed of in accordance with accepted practices.

4.1.13 POPULATION AND HOUSING EFFECTS

The existing pump station currently extracts approximately 7,000 AF of raw water per year from Folsom Lake. This would not change under the proposed action. Neither would the proposed action increase the available water supply. Rather, the proposed action would allow EID to take the same amount of water currently pumped from Folsom Lake from different temperature strata.

Because no additional water supplies or pumping capacity would occur with the proposed action, and because future pumping increases cannot occur without additional NEPA and CEQA documentation, there is no potential for the project to induce population growth.

4.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, none of the impacts or benefits discussed above for any resource would occur. EID would continue to withdraw water from Folsom Lake's coldwater pool. Salmon and steelhead in the lower American River would not benefit from the increment of conserved coldwater pool that results from the proposed action.

4.3 INDIAN TRUST ASSETS

The U.S. Department of Interior is responsible for ensuring that its actions do not negatively affect legal interests in property or rights, which are Indian Trust Assets (ITS), held in trust by the United States for Indian tribes or individuals. Trust status originates from rights imparted by treaties, statutes, or executive orders. The proposed action and No Action Alternative would not affect any ITS.

4.4 ENVIRONMENTAL JUSTICE

A Presidential Executive Order and subsequent Departmental Policy requires that Federal agencies ensure that their actions do not disproportionately effect minority and disadvantaged populations or communities with adverse human health effects or environmental effects. Reclamation policy requires that NEPA documents include a determination of adverse effects on minority or low-income populations. Residences along Folsom Lake in El Dorado Hills tend to be of higher-than-average value. There is no low-income housing within the vicinity of the project site. The proposed action and No Action Alternative would not have any effect on these issues of concern.

4.5 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Irreversible and irretrievable commitments of resources include the steel to build the structure and fuel to operate the equipment involved with construction and installation of the project under the proposed action. Under the No Action Alternative, these commitments of resources would not be made, but there would be an irretrievable commitment of an increment of cold water.

4.5.1 RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

In the short-term, the existing structure will continue to take water from the coldwater pool at the lake bottom. With the proposed action, in the long-term the water being extracted would better suit the purposes of its use, as well as improving the temperature of the water released into the lower American River for fisheries and aquatic biota. Without the TCD, the EID Raw Water Pump Station would continue to take water from the coldwater pool of Folsom Lake and send it to the water treatment plant. Although this would continue to serve the needs of the people for drinking water and eliminate the construction of the new TCD, the beneficial effects of an increment of conserved coldwater pool volume for release into the lower American River would be foregone.

5 CONSULTATION AND COORDINATION

The proposed action is being coordinated with the following agencies:

- National Marine Fisheries Service
- U.S. Army Corps of Engineers
- California Department of Fish and Game, Environmental Services Division
- Regional Water Quality Control Board
- El Dorado Irrigation District

The California Department of Parks and Recreation manages the Folsom State Recreation Area through an agreement with Reclamation. Folsom Lake qualifies as a "Waters of the U.S." and is under jurisdiction of the U.S. Army Corps of Engineers (Corps). Because construction activities would occur within the ordinary high water mark of Folsom Lake, compliance with Section 404 of the Clean Water Act may be required from the Corps. The RWQCB will require Water Quality Certification in accordance with Section 401 of the Clean Water Act. CDFG will require a Lakebed Alteration Agreement pursuant to Section 1601 of the Fish and Game Code, which would also address water quality issues. In addition to the measures included in the proposed action, excavation and construction activities would be conducted according to the guidelines and restrictions set forth by the Corps, RWQCB, and CDFG through their respective permit processes.

The draft EA and proposed FONSI has been distributed to the following agencies:

Mr. Mike Aceituno
National Marine Fisheries Service
650 Capitol Mall, Rm 6070
Sacramento, CA 95814

Mr. Wayne White, Field Supervisor
U.S. Fish and Wildlife Service
Sacramento Field Office
2800 Cottage Way, Suite W-2605
Sacramento, CA 95825

Mr. Tom Cavanaugh
United States Army Corps of Engineers
Sacramento District
Attn: Regulatory Branch
1325 J Street
Sacramento, CA 95814-2922

Mr. Dave Carlson
Central Valley Regional Water Quality Control Board
Sacramento Main Office
3443 Routier Road, Suite A
Sacramento, CA 95827-3003

Mr. John Nelson, Mr. Mike Healey
California Department of Fish and Game, Region II
1701 Nimbus Road, Suite C
Rancho Cordova, CA 95670

Ms. Jackie Ball, District Superintendent
California Department of Parks and Recreation
Gold Fields District
7806 Folsom-Auburn Road
Folsom, CA 95630

6 LIST OF ENVIRONMENTAL COMMITMENTS

The following permits/agreements are being acquired:

- CDFG Lakebed Alteration Agreement
- RWQCB 401 Water Quality Certification
- Corps Notice to Proceed under Section 404 Nationwide Permit

All environmental statutes would be complied with. All of the measures presented in Section 3.1.2 will be incorporated into the proposed action to minimize environmental effects. Also, all "Best Management Practices" that are described in the project description will be adhered to.

7 LIST OF PREPARERS

Phil Dunn	Project Director, Project Manager, and Senior Fisheries Biologist
Connie Gallippi	Project Coordinator and Environmental Analyst
Robert Solecki	Wildlife and Fisheries Biologist
Linda Leeman	Wildlife Biologist
Honey Walters	Air and Noise Specialist
Charlane Gross	Archaeologist
Cindy Davis	Regulatory Specialist
Gayiety Hasbrouck	Document Production

8 REFERENCES

8.1 PRINTED REFERENCES

California Air Resources Board. 1997. Asbestos Fact Sheet.

California Air Resources Board. 2001. CDFG. Special Animals List. Website. Url: http://arb.ca.gov. Accessed July, 2001.

California Air Resources Board. 2001. Website. Url: http://arb.ca.gov. Accessed July 2001.

California Department of Conservation, Division of Mines and Geology (CDMG). 1988. Mineral Land Classification: Portland Cement Concrete-grade Agonegate in the Sacramento-Fairfield Production-Consumption Region. Special Report 156.

California Department of Conservation, Division of Mines and Geology (CDMG). 2000 (March). Areas More Likely to Contain Natural Occurrences of Asbestos in Western El Dorado County, California. Ronald Churchill.

California Department of Finance. 2001. Demographics. Website. Url. http://www.dof.ca.gov Accessed on November 1, 2001.

California Natural Diversity Data Base (CNDDB). 2001. RareFind: A Database Application for the Use of the California Department of Fish and Game's Natural Diversity Data Base.

California Air Resources Board. Office of Air Quality and Transportation Planning. July 1995. URBEMIS7G Computer Program. Tool for Estimating Emissions from Land use Development Projects.

Caltrans. 1996. Transportation Related Earthborn Vibrations. Caltrans Technical Advisory. June 13, 1996.

El Dorado County. 1996. El Dorado General Plan.

El Dorado County Air Pollution Control District. Website. Url: http://www.co.el-dorado.ca.us/emd/. Accessed August 2001.

El Dorado County Air Pollution Control District. 2001. Draft: Guide to Air Quality Assessment/Determining Significance of Air Quality Impacts under the California Environmental Quality Act.

El Dorado County Chamber of Commerce. 2001. El Dorado County Demographics. Website. Url: http://eldoradocounty.org/demographics.html Accessed November 2, 2001.

Environmental Protection Agency (EPA). 1971 (December). Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances.

Environmental Protection Agency (EPA). 2001. Environfacts. Website. Url: http://www.epa.gov/enviro/html/ef_query.html Accessed Oct. 31, 2001.

Federal Transit Administration. 1995. Transit Noise and Vibration Impact Assessment.

Garza, Vicente et al. 1997. California Department of Transportation. Transportation Project-Level Carbon Monoxide Protocol.

Herzog Associates. 1989. Report on Geotechnical Services for EID Water Treatment Plant Additions, El Dorado Hills, CA. Prepared for Dewante and Stowell, Sacramento, CA. Sacramento, CA.

Lipscomb, David M., Ph.D., and Arthur C. Taylor, Jr., Ph.D. 1978. Noise Control Handbook of Principles and Practices.

O'Camb, Jim. 2001. Prevention Captain. El Dorado Hills Fire Department. Personal communication with B. Johnson of EDAW on October 31, 2001.

State of California. Governor's Office of Planning and Research. November 1998. General Plan Guidelines.

Tedeschi, Patrick. 2001. El Dorado Air Pollution Control District. Personal communication with EDAW.

Trefry, Kim. 2001. Supervising State Park Ranger. Folsom Lake State Park. Personal communication with B. Johnson of EDAW on October 31, 2001.

U.S. Bureau of Reclamation. 2001. Value Planning, Final Report, El Dorado Hills Raw Water Pumping Station, Temperature Control Device, Folsom Lake, California. Technical Services Center, Denver, CO.

U.S. Department of the Army, U.S. Army Corps of Engineers. 1989. Engineering and Design, Blasting Vibration Damage and Noise Prediction and Control. September 1, 1989

U.S. Department of Transportation, Federal Transit Administration. 1995. Transit Noise and Vibration Impact Assessment.

U.S. Environmental Protection Agency. Website. Url: http//epa.gov. Accessed August 2001.

U.S. Environmental Protection Agency. 1971. Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances.

8.2 PERSONAL COMMUNICATIONS

Ghaderi, Ahmad. 2001. Personal communication with H. Walters, EDAW.

Tedeschi, Patrick. 2001. El Dorado Air Pollution Control District. E-mail.