Appendix A
Climate Change Impacts Analysis

APPENDIX A

Climate Change Impacts Analysis

Introduction

Human activities are increasing the levels of certain gases, known as greenhouse gases (GHG), above natural background levels. GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide, hydroflourocarbons, perflourocarbons, and sulfur hexafluoride. The heat-trapping property of these gases has caused the Earth's surface temperature to rise by about 1 degree Fahrenheit in the past century, with accelerated warming during the past two decades. This change is causing, and will continue to cause, profound effects on the environment and the climate.

Across the United States and in California, observational trends from the last half century show warmer winter and spring temperatures, decreased spring snow levels in lower and mid-elevation mountains, up to 1-month earlier snowpack melting, and flowers blooming 1 to 2 weeks earlier than under historical conditions (Cayan et al., 2006b). Research suggests that human activities, such as the burning of fossil fuels and clearing of forests, contribute additional CO_2 and other heat-trapping gas emissions into the atmosphere. Future global climate change could have widespread consequences that would affect many of California's important resources.

Background/Environmental Setting

Existing Air Quality – Greenhouse Gases and Their Link to Climate Change

Various gases in the Earth's atmosphere, classified as atmospheric GHGs, play a critical role in determining the Earth's surface temperature. Solar radiation enters Earth's atmosphere from space, and a portion of the radiation is absorbed by the Earth's surface. The Earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower frequency infrared radiation. GHGs, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect.

Among the prominent GHGs contributing to the greenhouse effect are CO_2, CH_4, ozone, water vapor, nitrous oxide, and chlorofluorocarbons. Human-caused emissions of these GHGs in excess of natural ambient concentrations are responsible for enhancing the greenhouse effect (Ahrens, 2003). Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors (California Energy Commission [CEC], 2006). In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation (CEC, 2006). A byproduct of fossil fuel combustion is CO_2. CH_4, a highly potent GHG, results from offgassing associated with agricultural practices and landfills. Processes that absorb and accumulate CO_2, often called CO_2 "sinks," include uptake by vegetation and dissolution into the ocean.

As the name implies, global climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern, respectively. California is the 12th to 16th largest emitter of CO_2 in the world and produced 492 million gross metric tons of CO_2 equivalents in 2004 (CEC, 2006). CO_2 equivalents is a measurement used to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. This potential, known as the global warming potential of a GHG, is also dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. For example, CH_4 is a much more potent GHG than CO_2. As described in Appendix C, "Calculation Referenced," of the General Reporting Protocol of the California Climate Action Registry (2006), one ton of CH_4 has the same contribution to the greenhouse effect as approximately 21 tons of CO_2. Expressing GHG emissions in CO_2 equivalents takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted. Consumption of fossil fuels in the transportation sector was the single largest source of California's GHG emissions in 2004, accounting for 40.7 percent of total GHG emissions in the state (CEC, 2006). This category was followed by the electric power sector (including both in-state and out-of-state sources) (22.2 percent) and the industrial sector (20.5 percent) (CEC, 2006).

Feedback Mechanisms and Uncertainty

Many complex mechanisms interact within Earth's energy budget to establish the global average temperature. For example, a change in ocean temperature would be expected to lead to changes in the circulation of ocean currents, which, in turn, would further alter ocean temperatures. There is uncertainty about how some factors could affect global climate change because they have the potential to both enhance and neutralize future climate warming. Examples of these conditions are also described below.

Direct and Indirect Effects of Aerosols

Aerosols, including particulate matter, reflect sunlight back to space. As particulate matter attainment designations are met, and fewer emissions of particulate matter occur, the cooling effect of anthropogenic aerosols would be reduced, and the greenhouse effect would be further enhanced. Similarly, aerosols act as cloud condensation nuclei, aiding in cloud formation and increasing cloud lifetime. Clouds can efficiently reflect solar radiation back to space (see discussion of the cloud effect below). As particulate matter emissions are reduced, the indirect positive effect of aerosols on clouds would be reduced, potentially further amplifying the greenhouse effect.

The Cloud Effect

As global temperature rises, the ability of the air to hold moisture increases, facilitating cloud formation. If an increase in cloud cover occurs at low or middle altitudes, resulting in clouds with greater liquid water content such as stratus or cumulus clouds, more radiation would be reflected back to space, resulting in a negative feedback mechanism, wherein the side effect of more cloud cover resulting from global warming acts to balance further warming. If clouds form at higher altitudes in the form of cirrus clouds, however, these clouds actually allow more solar radiation to pass through than they reflect and, ultimately, they act as a GHG themselves. This results in a positive feedback mechanism in which the side effect of global warming acts to enhance the warming process. This feedback

mechanism, known as the "cloud effect," contributes to uncertainties associated with projecting future global climate conditions.

Other Feedback Mechanisms

As global temperature continues to rise, CH_4 gas currently trapped in permafrost would be released into the atmosphere when areas of permafrost thaw. Thawing of permafrost attributable to global warming would be expected to accelerate and enhance global warming trends. Additionally, as the surface area of polar and sea ice continues to diminish, the Earth's albedo, or reflectivity, is also anticipated to decrease. More incoming solar radiation will likely be absorbed by the Earth rather than being reflected back to space, further enhancing the greenhouse effect. The scientific community is still studying these and other positive and negative feedback mechanisms to better understand their potential effects on global climate change.

Regulatory Background

International and state legislation has been enacted to deal with global climate change. In 1988, the United Nations and the World Meteorological Organization established the Intergovernmental Panel on Climate Change to assess scientific information relevant to human-induced climate change, impacts, and mitigation. Although the Intergovernmental Panel on Climate Change has no regulatory authority, it is considered an authoritative source for information on climate change because of the cooperative efforts of numerous scientists from many countries.

In 1994, the United States joined a number of countries in signing the United Nations Framework Convention on Climate Change (UNFCCC). Under the UNFCCC, governments gather and share information on GHG emissions, policies, and best practices. They also launch strategies for addressing GHG emissions and adapting to expected impacts. One result of UNFCCC efforts is the treaty known as the Kyoto Protocol. More than 160 countries have signed the treaty to demonstrate their commitment to reduce emissions of GHGs or to engage in emissions trading. The United States was not a signatory to the treaty and has approached the reduction of GHG emissions at the federal level on a voluntary basis thus far. The states' responses have been varied and different, especially in California.

The State of California mandated, through legislation, reductions of GHG emissions. These mandates include Assembly Bill (AB) 1493, Executive Order S-3-05, AB 32, and Senate Bill (SB) 1368. The following describes each of the regulatory framework that has been established in the State of California.

Assembly Bill 1493

In 2002, then-Governor Gray Davis signed AB 1493. AB 1493 requires that the California Air Resources Board (ARB) develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of GHGs emitted by passenger vehicles and light-duty truck and other vehicles determined by the ARB to be vehicles whose primary use is noncommercial personal transportation in the state."

Executive Order S-3-05

Executive Order S-3-05, which was signed by Governor Arnold Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the Executive Order established total GHG emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

The Executive Order directed the Secretary of the California Environmental Protection Agency to coordinate a multi-agency effort to reduce GHG emissions to the target levels. The Secretary will also submit biannual reports to the governor and state legislature describing (1) progress made toward reaching the emission targets; (2) impacts of global warming on California's resources; and (3) mitigation and adaptation plans to combat these impacts. To comply with the Executive Order, the Secretary of the California Environmental Protection Agency created a Climate Act Team made up of members from various state agencies and commission. The Climate Act Team released its first report in March 2006. The report proposed to achieve the targets by building on voluntary actions of California businesses, local government, and community actions, as well as through state incentive and regulatory programs.

Assembly Bill 32, the California Climate Solutions Act of 2006

In September 2006, Governor Arnold Schwarzenegger signed AB 32, the California Climate Solutions Act of 2006. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by the year 2020. This reduction will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in year 2012. To effectively implement the cap, AB 32 directs ARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then ARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

AB 32 requires that ARB adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrives at the cap; institute a schedule to meet the emissions cap; and develop tracking, reporting, and enforcement mechanisms to ensure that the state achieves reductions in GHG emissions necessary to meet the cap. AB 32 also includes guidance to institute emissions reductions in an economically efficient manner and conditions to ensure that businesses and consumers are not unfairly affected by the reductions.

Senate Bill 1368

SB 1368 is the companion bill of AB 32 and was signed by Governor Arnold Schwarzenegger in September 2006. SB 1368 requires the California Public Utilities Commission to establish a GHG emission performance standard for baseload generation from investor-owned utilities by February 1, 2007. The CEC must establish a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed

the GHG emission rate from a baseload combined-cycle natural gas-fired plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the California Public Utilities Commission and CEC.

Analysis

The project will include some activities that emit greenhouse gases, such as the use of vehicles during construction and the ongoing maintenance of the facility during operation. Proposed construction techniques are typical of other similar projects throughout the state, and the industry is participating in the development of new regulations and construction practices through the implementation of AB 32 and other national and international efforts. The construction GHG emissions are temporary and small in relation to the overall inventory for the state, and are considered de minimus. Operational activities are expected to remain similar to current levels, resulting in no appreciable net change from current efforts.

Climate change is by definition global in scope. The mechanisms and interactions that result in global climate change are complex, and uncertainties exist in GHG feedback mechanisms. In addition, there currently are no adopted significance thresholds for GHG emissions. Because of such uncertainties and the lack of significance thresholds, the project's potential impacts on global climate change are speculative, and the project's relatively small emissions make further evaluation unwarranted.

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Appendix B
DEIS/EIR with Changes in Redline

Public Draft
Redline Version

Fish Passage Improvement Project

at the

RED BLUFF DIVERSION DAM

EIS/EIR

ENVIRONMENTAL IMPACT STATEMENT/ENVIRONMENTAL IMPACT REPORT

CEQA Lead- Tehama-Colusa Canal Authority

NEPA Lead- U.S. Bureau of Reclamation

Prepared for

Tehama-Colusa Canal Authority

Willows, California

State Clearinghouse No. 2002-042-075

CH2MHILL

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Executive Summary

Draft Environmental Impact Statement/Environmental Impact Report Fish Passage Improvement Project at the Red Bluff Diversion Dam

Lead Agencies

Tehama-Colusa Canal Authority and U.S. Bureau of Reclamation

August 2002

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2525 Airpark Drive
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Fish Passage Improvement Project at the Red Bluff Diversion Dam Executive Summary

Introduction

The Tehama-Colusa Canal Authority (TCCA) Fish Passage Improvement Project at the Red Bluff Diversion Dam (RBDD) Draft Environmental Impact Statement/Environmental Impact Report (DEIS/EIR) addresses the environmental issues, alternatives, and impacts associated with improvement of anadromous fish passage, both upstream and downstream, at RBDD.

This DEIS/EIR was prepared by TCCA and the U.S Bureau of Reclamation (USBR) (see Section 5.1 for agency involvement and a list of the agency approvals required for the project to proceed). This document meets the legal requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) and discloses relevant information to interested parties and invites such parties to play a role in both the decisionmaking process and the implementation of that decision. This DEIS/EIR also provides federal, state, and local decision makers with detailed information concerning the significant environmental, cultural, and other impacts associated with the alternative courses of action.

By preparing a single document that complies with both statutes, the involved agencies have avoided duplication of effort. The statutes are similar in that they require federal and state agencies to consider a range of alternatives to meet the project purpose, to evaluate the impacts of the alternatives, and to disclose the alternatives and impacts to the public prior to making a commitment of resources. The statutes differ in several ways, two of the more substantive being:

- CEQA requires state agencies to implement feasible mitigation, whereas NEPA requires only that federal agencies consider mitigation
- CEQA requires that proposed actions be compared to existing conditions, whereas NEPA requires ~~only~~ that they be compared to future conditions without the project

Prior to the completion of RBDD in the mid-1960s, anadromous fish had unimpeded passage through the current dam site. The dam created a barrier in the Sacramento River, impeding and delaying passage to spawning and rearing habitat above the dam. The dominant feature of RBDD is its gates. When the gates are lowered (gates-in) into the Sacramento River, the elevation of the water surface behind the dam rises, allowing gravity diversion into the Tehama-Colusa (TC) and Corning canals for delivery to irrigation districts. Raising the gates allows the river to flow virtually unimpeded but precludes gravity diversion into the canals. When the gates are lowered, RBDD presents a barrier for both upstream- and downstream-migrating fish because fish ladders, included in the

original dam design, have proven inefficient at certain flows to pass anadromous fish to upstream spawning grounds. Additionally, the tailrace and lake created by the dam provide habitat for species that prey on juvenile salmon, reducing their overall survival rates.

In 1993, the National Marine Fisheries Service (NMFS) issued a Biological Opinion for endangered winter-run Chinook salmon, requiring that the gates be kept in the raised position (gates-out) for a greater portion of the year (September 15 through May 14) than had been required previously. This has significantly improved fish passage at RBDD, but has made the facility less effective as a water source for agriculture. The current gates-in schedule may be subject to further reduction, if it is found to be a reasonable and prudent action, to avoid jeopardy to species recently listed as endangered under the federal Endangered Species Act (ESA) or the California Endangered Species Act (CESA). Species of concern include winter-, spring-, and fall-/late-fall-run salmon; steelhead; sturgeon; and splittail. However, further reduction of the gates-in period would further reduce RBDD's ability to divert water for agriculture.

Purpose and Need for the Action

NEPA regulations require that each environmental impact statement (EIS) briefly specify the purpose and need to which the agency is responding in proposing the various alternatives, including the preferred alternative. Similarly, CEQA requires that each environmental impact report (EIR) include a statement of the objectives sought by the proposed project. The objectives are intended to help the implementing agency develop a reasonable range of alternatives and aid decision makers in preparing findings or statements of overriding consideration, if necessary. For the purposes of this document, the NEPA-mandated purpose and need statement and the CEQA-mandated project objective are synonymous.

Purpose and Need Statement

The purpose of the project is twofold:

- Substantially improve the long-term ability to reliably pass anadromous fish and other species of concern, both upstream and downstream, past RBDD.
- Substantially improve the long-term ability to reliably and cost-effectively move sufficient water into the TC Canal and Corning Canal systems to meet the needs of the water districts served by TCCA.

The need for this project is in response to the continued, well-documented fish passage and agricultural water diversion reliability problems associated with the operation of RBDD.

Tehama-Colusa and Corning Canals

Tehama-Colusa Canal

TC Canal construction began in 1964 and was completed in 1980. The canal is a 111-mile long, concrete-lined structure starting at RBDD and ending approximately 2 miles south of Dunnigan. The canal travels through Tehama, Glenn, and Colusa counties, and ends in Yolo County.

The canal was built as a result of signed contracts between USBR and water districts dating back as early as 1954. The water districts served by the canal include Orland-Artois, Glide, Kanawha, Holthouse, 4-M, Glenn Valley La Grande, Davis, Westside, Myers-Marsh, Cortina, Colusa County, and Dunnigan water districts. Glenn-Colusa Irrigation District also takes water from the TC Canal periodically.

Corning Canal

The Corning Canal was authorized in 1950 as part of the Central Valley Project (CVP) and completed in 1959. It is a 21-mile-long, earth-lined canal starting at RBDD and ending about 4 miles south of the City of Corning.

The water districts served by the canal include Proberta, Thomes Creek, Corning, and Kirkwood water districts. The Corning Water District was formed in 1954, specifically to supplement the local groundwater supply with water from CVP.

The diverted water is used mainly for irrigating agriculture, with a very small percentage used for non-agriculture purposes. The principal crop types associated with the TC and Corning canals include almonds, olives, rice, corn, wheat, alfalfa, vine seeds, irrigated pasture, beans, sugar beets, tomatoes, and orchard fruits.

Description of Alternatives

Alternatives were developed to provide a reasonable range of actions that satisfied statutory requirements and were feasible. Alternatives were selected based on public input, scientific information, and professional judgement.

Preferred Alternative

The TCCA Board of Directors (TCCA Board) determined the Gates-out Alternative to be the Preferred Alternative (Resolution No. 01-06). The Gates-out Alternative was chosen during a board meeting held on December 5, 2001. This decision stemmed from the idea that "selection of a Preferred Alternative at this time simply allows the work on the solution to the fish passage and water delivery reliability problems at the Red Bluff Diversion Dam to continue…" Through this resolution, the TCCA Board reserves the right to change the selected Preferred Alternative in the future. Additionally, the selection of the Preferred Alternative in no way commits the TCCA Board or TCCA to any particular course of action, nor does it commit any expenditure of funds for any purpose.

Following this decision, the TCCA Board held a subsequent meeting on February 6, 2002. One of the topics of discussion included the TCCA Board's commitment to the Gates-out Alternative but their willingness to consider alternatives such as the "Flexible Gate" Alternative.

USBR has not yet chosen a Preferred Alternative. A list of the alternatives that are currently being evaluated, including the No Action Alternative, follows.

No Action Alternative

CEQA requires that the Preferred Alternative be compared to an existing conditions base-line, whereas NEPA requires comparison with a No Action Alternative. The No Action Alternative represents ongoing activities and operations and corresponds to the "No Project" definition as outlined in the *CEQA Guidelines*, Section 15126, as "a condition that would be reasonably expected to occur if the project were not approved."

- RBDD Operations: Gates-in 4 months (May 15 through September 15)
- Continue operating the Research Pumping Plant (RPP) and add a fourth pump
- Eliminate Stony Creek diversions because of lack of feasible options for constructing a fish screen on the Constant Head Orifice (CHO), which is used as an intake to the canal

1A: 4-month Improved Ladder Alternative

This alternative would continue the current operation of the dam with a 4-month gates-in period of May 15 through September 15. Improved agricultural water deliveries would be achieved through 1,700 cubic feet per second (cfs) of pumping capacity (320 cfs at RPP; 1,380 cfs at Mill Site). Improvements to fish passage would be achieved with construction and operation of new ladders (right 800 cfs, left 831 cfs, for a total of 1,631 cfs).

- RBDD Operations: Gates-in 4 months (May 15 through September 15)
- Install new 1,380-cfs pump station with fish screen at Mill Site; continue operating the RPP and add a fourth pump resulting in a combined pumping capacity of 1,700 cfs
- Install a conveyance facility across Red Bank Creek to convey water from the pump station to the TC Canal
- Modify the left and right bank fish ladders
- Implement Adaptive Management Program

1B: 4-month Bypass Alternative

This alternative would continue the current operation of the dam with a 4-month gates-in period of May 15 through September 15. Improved agricultural water deliveries would be achieved through 1,700 cfs of pumping capacity (320 cfs at RPP; 1,380 cfs at Mill Site). Improvements to fish passage would be achieved with construction and operation of a new ladder at the right abutment (800 cfs). A 1,000-cfs bypass channel for fish passage would be constructed at the left abutment near the existing Discovery Center. This alternative requires an amendment to the U.S. Forest Service (USFS), Mendocino National Forest Land and Resource Management Plan.

- RBDD Operations: Gates-in 4 months (May 15 through September 15)
- Install new 1,380-cfs pump station with fish screen at Mill Site; continue operating the RPP and add a fourth pump resulting in a combined pumping capacity of 1,700 cfs
- Install a conveyance facility across Red Bank Creek to convey water from the pump station to the TC Canal
- Install a new 1,000-cfs bypass around left abutment of dam

- Modify the right bank fish ladder
- Implement Adaptive Management Program
- Amend Mendocino National Forest Land and Resource Management Plan to allow construction of the bypass facility

2A: 2-month Improved Ladder Alternative

This alternative would reduce the current operation of the dam to a 2-month gates-in period of July 1 to August 31. Improved agricultural water deliveries would be achieved through 2,000 cfs of pumping capacity (320 cfs at RPP; 1,680 cfs at Mill Site). Improvements to fish passage would be achieved with construction and operation of new ladders (right 800 cfs, left 831 cfs, total 1,631 cfs) and the reduced gates-in operation.

- RBDD Operations: Gates-in 2 months (July 1 through August 31)
- Install a new 1,680-cfs pump station with fish screen at Mill Site; continue operating RPP and add a fourth pump resulting in a combined pumping capacity of 2,000 cfs
- Install a conveyance facility across Red Bank Creek to convey water from the pump station to the TC Canal
- Modify the left and right bank fish ladders
- Implement Adaptive Management Program

2B: 2-month with Existing Ladders Alternative

This alternative would reduce the current operation of the dam to a 2-month gates-in period of July 1 to August 31. Improved agricultural water deliveries would be achieved through 2,000 cfs of pumping capacity (320 cfs at RPP; 1,680 cfs at Mill Site). Improvements to fish passage would be achieved through the reduced gates-in period. Existing ladders would continue to be operated at the right and left abutments (right 338 cfs, left 338 cfs, total 676 cfs).

- RBDD Operations: Gates-in 2 months (July 1 through August 31)
- Install a new 1,680-cfs pump station with fish screen at Mill Site; continue operating RPP and add a fourth pump resulting in a combined pumping capacity of 2,000 cfs
- Install a conveyance facility across Red Bank Creek to convey water from the pump station to the TC Canal
- Implement Adaptive Management Program

3: Gates-out Alternative

The Gates-out Alternative would eliminate the gates-in period. Improved agricultural water deliveries would be achieved through 2,500 cfs of pumping capacity (320 cfs at RPP; 2,180 cfs at Mill Site). Improvements to fish passage would be achieved through the reduction in gate operations. Existing ladders would no longer operate.

- RBDD Operations: Gates-in 0 months

- Install a new 2,180-cfs pump station with fish screen at Mill Site; continue operating RPP and add a fourth pump resulting in a combined pumping capacity of 2,500 cfs
- Install a conveyance facility across Red Bank Creek to convey water from the pump station to the TC Canal
- Implement Adaptive Management Program.

Table ES-1 summarizes the alternatives.

TABLE ES-1
Summary of Alternatives

	Gates-in Operation		Fish Passage Facilities				Gates-out Water Supply			
Name	Duration	Timing	Right Bank (cfs)	Center (cfs)	Left Bank (cfs)	RPP (cfs)	Right Fish Ladder (cfs)	Mill Site (cfs)	Stony Creek (cfs)	Total (cfs)
Existing Conditions	4 months	May 15 through Sept 15	(E) 338	(E) 100	(E) 338	240	165		600	1,005
No Action	4 months	May 15 through Sept 15	(E) 338	(E) 100	(E) 338	320	165			485
4-month Improved Ladder	4 months	May 15 through Sept 15	(N) 800		(N) 831	320		1,380		1,700
4-month Bypass	4 months	May 15 through Sept 15	(N) 800		Bypass Channel 1,000; (E) 338	320		1,380		1,700
2-month Improved Ladder	2 months	Jul 1 through Aug 31	(N) 800		(N) 831	320		1,680		2,000
2-month with Existing Ladders	2 months	July 1 through Aug 31	(E) 338		(E) 338	320		1,680		2,000
Gates-out	0 months					320		2,180		2,500

Affected Environment and Environmental Consequences

Fishery Resources

The fishery resources in the Sacramento River near RBDD consist of a diverse collection of species including native anadromous salmonids (NAS), other native anadromous fish (NAO), non-native anadromous fish (NNA), and resident native and non-native fish (RN and RNN). The Sacramento River is the largest river system in California and more than 90 percent of the Central Valley salmon spawning and rearing occurs within this river system. The Sacramento River supports four runs (races) of Chinook salmon (fall, late-fall, winter, and spring run) and steelhead. Other native anadromous species such as white sturgeon, green sturgeon, Pacific lamprey, and river lamprey also occupy or have the potential to occupy the Sacramento River at various stages of their life history and during seasonal intervals. Table ES-2 shows the life history timing for these species in the Sacramento River, near RBDD.

TABLE ES-2
Life History Timing in the Sacramento River Near RBDD

Name	Adult Immigration	Spawning	Incubation	Larval/Juvenile Rearing	Juvenile Emigration
Fall Chinook	July-Dec	Oct-Dec	Oct-Mar	Dec-Jun	Dec-Jul
Late-fall Chinook	Oct-Apr	Jan-Apr	Jan-Jun	Apr-Nov	Apr-Dec
Spring Chinook	Apr-Jul	Aug-Oct	Aug-Dec	Oct-Apr	Oct-May
Winter Chinook	Dec-Jul	Apr-Aug	Apr-Oct	Jul-Mar	Jul-Mar
Steelhead	Aug-Mar	Dec-Apr	Dec-Jun	Year-round (1 to 2 years)	Jan-Oct
White Sturgeon	Feb-May	Feb-Jun	Embryos planktonic drifting downstream	Larvae in river, juveniles in Delta	N/A
Green Sturgeon	Feb-Jun	Mar-Jul	Embryos planktonic drifting downstream	Larvae in river, juveniles in Delta	Jun-Aug
Pacific Lamprey	Feb-Jun	Spring-Summer	Brief followed by ammocoete larval stage	Up to 7 years	Sep-Apr
River Lamprey	Feb-Jun	Spring-Summer	Brief followed by ammocoete larval stage	Up to 5 years	Mar-Jun

N/A = White sturgeon are not known to spawn upstream of RBDD.

In the vicinity of RBDD, the Sacramento River acts primarily as a transport corridor for adults immigrating upstream, juvenile fry rearing and dispersing, and smolts emigrating downstream.

All five anadromous salmonid fish species are either listed by California Endangered Species Act and/or the federal Endangered Species Act, or are listed as candidates under the federal ESA. Additionally, green sturgeon is a California Species of Special Concern Class1: Qualify as Threatened; river lamprey is a California Species of Special Concern Class 3: Watch List; and Pacific lamprey is a California Species of Special Concern Class 4: Population Status Apparently Secure (Moyle et al., 1995).

Impacts of Current Operations. Current operation of RBDD includes a 4-month period when the gates are placed in the river, creating a velocity barrier and whitewater turbulence, which prevents or impedes fish passage. Fish ladders, located on the east and west sides and at the center of the dam, are operational during the gates-in period to provide passage. Under current operations, approximately 25 percent of adult fall-run Chinook salmon, 15 percent of adult winter-run Chinook salmon, 72 percent of adult spring-run Chinook salmon, 17 percent of adult steelhead, 35 percent of adult green sturgeon, and 25 percent of adult lamprey are affected by operation of the dam. Of the juvenile species, approximately 39 percent of winter-run Chinook salmon, 35 percent of late-fall-run Chinook salmon, 36 percent of steelhead, nearly all of the larval/juvenile green sturgeon, 6 to 7 percent of downstream-migrating Pacific lamprey, and 30 percent of downstream-migrating river lamprey are subject to the operational effects of the dam and its associated diversion facilities.

Construction impacts could potentially be significant to all species and life stages of fish in the project area. Loss to adult and juvenile species could be caused by construction activities

such as sheet pile installation and increased sediment and turbidity from in-river activities. Mitigation would reduce these impacts to a less than significant level.

All of the impacts associated with the operation of all of the alternatives are beneficial to increased fish passage. Reduced gate operation alternatives would produce the largest measurable benefit to both NAS and NAO. Adult spring-run Chinook salmon would receive the largest measurable benefit under the 2-month and Gates-out alternatives, with an approximate 79 to 91 percent improvement, while adult green sturgeon would realize an approximate 54 percent improvement in passage. Adult fall-run Chinook salmon show an approximate 9 to 20 percent improvement, and adult lamprey show an approximate 17 to 20 percent improvement in passage under the 2-month and Gates-out alternatives. Juvenile NAS show little to no measurable benefit under any of the alternatives; however, juvenile green sturgeon show an approximate 21 to 38 percent improvement under the 2-month and Gates-out alternatives, and river lamprey shows an approximate 15 percent improvement under both the 2-month and Gates-out alternatives.

Water Resources

Surface-water Hydrology and Management. RBDD is located approximately 60 river miles downstream from Shasta and Keswick dams. Shasta and Keswick dams are the ultimate barriers to anadromous fish migrations in the Sacramento River. The average monthly flow of the Sacramento River ranges from approximately 6,000 cfs to 20,000 cfs, with maximum flows reaching over 100,000 cfs.

The gates on RBDD are in place from mid-May to mid-September. When RBDD gates are in, the water level in the Sacramento River just above the dam rises approximately 14~~12~~ feet, which results in the formation of Lake Red Bluff. When full, the lake contains approximately 3,900 acre-feet of water and extends approximately 6 miles upstream through the City of Red Bluff. RBDD affects river surface elevations upstream of the dam. During the gates-in period, the surface-water elevation at the dam is maintained at 252.5 feet. During the gates-out period (September 16 through May 14), surface-water elevations at RBDD range from approximately 238.5 feet (at 4,000 cfs) to 254 feet (at 100,000 cfs).

Neither construction nor operation of any of the alternatives would negatively affect the hydrology or water management in the project area.

Water Quality. The primary water quality concerns in the DEIS/EIR are Sacramento River water temperature, turbidity, and sediment deposition. According to the State Water Resources Control Board's Order 90-5, the temperature objective for the operation of CVP facilities for the upper Sacramento River from Keswick Dam to RBDD is less than or equal to 56 degrees Fahrenheit (^{o}F) (CALFED Bay-Delta Program, 1999). Additionally, the 1993 NMFS biological opinion designated 56^{o}F as the temperature to be maintained in the river from Keswick Dam to Bend Bridge, and requires a gates-out operation for a greater portion of the year. From 1998 to 2000, the water temperature exceeded the temperature objective established by Order 90-5 during the gates-in period, 85 percent of the time, with an average temperature of 56.7^{o}F. The average year-round temperature during the same period was 53.8^{o}F with roughly 38 percent of the data exceeding the 56^{o}F temperature standard.

None of the proposed alternatives would result in significant impacts to water quality. All potential impacts to water quality from the project would be caused by construction activities. Construction could potentially increase erosion in the project area, which could ultimately produce large amounts of sediment in the Sacramento River. Additionally, construction equipment used onsite would require the use of hazardous materials (i.e., diesel fuels and cleaning solvents), which could result in spills that could affect nearby waterways. Mitigation would reduce these potential impacts to a less than significant level.

Groundwater. Groundwater quality is generally excellent in the region. In the most recent summary of groundwater conditions conducted in 1991, total dissolved solids (TDS) in the Red Bluff area was classified as less than 200 mg/L, which is better than ~~below~~ drinking water standards. No evidence of elevated levels of boron, nitrates, arsenic, or selenium has been found in the groundwater in the Red Bluff area. Any contaminated soil identified during construction would be disposed according to applicable standards. Mitigation would reduce these potential impacts to a less than significant level.

Biological Resources

The land around the project area is predominantly agricultural or formerly agricultural. The few areas of native vegetation generally occur adjacent to or near the river corridor, in old river meanders, or in natural low-lying wet areas. The project site contains seven primary habitats:

- Riparian
- Freshwater marsh
- Mixed woodland
- Restored
- Annual grassland
- Disturbed
- Parkland

About 79 acres of the project site consists of disturbed areas. Disturbed habitat occurs on both sides of the Sacramento River and were created by former agricultural practices, restoration plantings (i.e., plowed fields), RBDD maintenance activities, pre-dam land uses, and activities at the Mill Site. Of the 79 acres, 51 acres are bare ground, 13 acres are dominated by star thistle, and 15 acres are dominated by blackberry bushes. Less than 1 acre is covered by a riprap pile composed of dam-building material.

Temporary and permanent impacts on riparian, freshwater marsh, disturbed, and parkland would occur under all of the alternatives. The largest of these impacts occurs under the 4-month Bypass Alternative. Under the 4-month Bypass Alternative, temporary and permanent impacts also occur on mixed woodland and restored habitat. Table ES-3 lists the acreage of each habitat type that would be affected by each alternative. Acreage is divided into temporary and permanent impacts for each alternative.

Special-status Species. Fifty-eight special-status wildlife species and 15 plant species were identified as having the potential to occur in or near the project area. Six species that are state- or federal-listed as threatened or endangered were identified as potentially occurring in the project area. These species include little willow flycatcher, western yellow-billed

cuckoo, bald eagle, Swainson's hawk, peregrine falcon, and valley elderberry longhorn beetle (VELB).

TABLE ES-3
Acreage of Habitat Impacts for Project Alternatives

	Alternatives										
		1A: 4-month Improved Ladder		1B: 4-month Bypass		2A: 2-month Improved Ladder		2-month with Existing Ladders		3: Gates-out	
Vegetation Habitat	No Action	Permanent Impact	Temporary Impact	Permanent Impact	Temporary Impact	Permanent Impact	Temporary Impact	Permanent Impact	Temporary Impact	Permanent Impact	Temporary Impact
Riparian	0	2.18	5.56	2.60	6.30	2.18	5.56	2.05	4.76	2.05	4.76
Freshwater marsh	0	0.05	0.71	0.05	0.71	0.05	0.71	0.05	0.71	0.05	0.71
Mixed woodland	0	0	0	1.37	4.30	0	0	0	0	0	0
Restored habitat	0	0	0	4.96	4.80	0	0	0	0	0	0
Annual grassland	0	0	0	0	0	0	0	0	0	0	0
Disturbed	0	11.75	44.12	12.90	51.70	11.75	44.12	11.36	41.35	11.36	41.3
Parkland	0	0.19	4.86	4.19	12.32	0.19	4.86	0	0	0	0

All of the alternatives require the removal of elderberry shrubs and three osprey nests. The removal of the elderberry shrubs could negatively affect VELB. Additionally, removal of the osprey nests could negatively impact the birds that were occupying two of the nests during the project area survey. Mitigation would reduce these impacts to a less than significant level.

Recreation

Potential project impacts on recreational opportunities, activities, and facilities of the project area were identified as a key concern of project stakeholders. Changes to recreation opportunities resulting from the proposed project alternatives were analyzed to determine the extent to which impacts may exist. While the project area is limited to RBDD and the Mill Site, the facilities examined in the physical recreational analysis are broader; extending north along the Sacramento River from RBDD to Ide Adobe State Historic Park.

According to a study by California State University, Chico, approximately 64,000 individuals recreated in and along the Sacramento River from RBDD to Ide Adobe State Historical Park during 1995. Most used one of three locations: River Park (also known as City Park), Ide Adobe State Historical Park, and the boat launch ramp area at the Red Bluff Recreation Area (Recreation Area) south of RBDD. More than half of the individuals counted in the survey recreated in the area during the summer months between May and

September. This time frame also correlates to the current gates-in period of the dam, resulting in the creation of Lake Red Bluff.

Special holidays and well-attended activities result in increased recreation patronage during the summer, including the annual July 4 fireworks celebration at River Park and the Nitro National Drag Boat Festival on Memorial Day weekend.

Bypass construction would significantly impact the Sycamore Grove Campground and the outdoor recreational experience of campers. The campground would be bisected with a constructed channel structure, eliminating campsites and separating a portion of the Recreation Area. Additionally, the associated loss of riparian woodlands for educational/ interpretive uses is in conflict with the Lake Red Bluff Final EIS (FEIS). The Lake Red Bluff FEIS stresses the importance of recreational uses in concert with the restoration of riparian habitat and public education of the area's natural environment.

Reduced gate operations under the 2-month gates-in alternatives and Gates-out Alternative would limit Lake Red Bluff recreational activities to 2 months annually, or eliminate lake recreation all together. These activities, characterized as "lake-dependent" include boating, jet skiing, water skiing, and swimming and would cause the greatest impact. Additionally, the Nitro National drag boat races could not be held over the Memorial Day holiday weekend. These impacts are significant to local residents and users of the recreational facilities. No mitigation has been identified that would reduce this impact.

Land Use

The predominant land use in the immediate area of the project is general industrial and recreation. A large portion of the land adjacent to Lake Red Bluff is the Recreation Area and is used for recreational and educational purposes. The project facilities lie entirely within the County of Tehama.

Generally, construction and operations of the proposed facilities would be consistent with existing land use and land use plans, with two exceptions: the bypass channel and changed gate operations.

Construction and operations of the 4-month Bypass Alternative would result in a conflict with the existing land use plan for the Recreation Area. The bypass channel would require removal of camping sites and would isolate the Discovery Center, drastically reducing its utility. Further, the existing Recreation Area has been developed through extensive volunteer efforts and has been the focus for many educational programs, which add to its unique character. Additionally, a number of boat ramps and docks have been developed to take advantage of Lake Red Bluff. If gate operations were reduced to 2-month operations or gates-out operations year-round, these boat ramps and docks would no longer be functional during the additional gates-out period, causing impacts to current land use. No mitigation is available to offset these impacts.

Geology

The project area is on the upper member of the Riverbank Formation, a Late Pleistocene-age stream/terrace deposit of fluvial/deltaic origin. This unit consists of moderately well-consolidated, interconnected, and discontinuous layers and lenses of channel and overbank

deposits containing varying mixtures of gray, brown, reddish-brown, and red-orange-brown gravel, sand, silt, and clay. These deposits occur along channels, floodplains, and natural levees of major streams; are highly permeable; and vary in thickness from 5 to 15 feet (Regional Water Quality Control Board, 1990).

Groundwater in the immediate vicinity of Lake Red Bluff is greatly affected by the annual filling of the lake. This change in the surface elevation of the Sacramento River corresponds to a change in the groundwater hydraulic gradient as evidenced by groundwater elevation measurements recorded during the gates-in and gates-out periods.

Pactiv Corporation (Pactiv) land occupies an 8.3-acre site approximately 1,400 feet upstream of RBDD. The Pactiv landfill is used for the disposal of dried paper sludge generated at the onsite industrial wastewater treatment facility. Further upstream of this site, an active wastewater treatment plant currently discharges approximately 1.9 million gallons per day to the Sacramento River.

Under all of the alternatives, a large quantity of material would need to be excavated, up to approximately 800,000 cubic yards (CY). This includes excavation for the pumping station and forebay, as well as the right bank and left bank fish ladders, and bypass channel. Approximately 600,000 CY of this material would be stored onsite. Removal and storage of this material could cause soil erosion, movement of sediments, loss of topsoil, and associated water quality impacts. Mitigation would reduce these impacts to a less than significant level.

Agricultural Resources

Agriculture is the largest industry in the Sacramento Valley. The region produces a wide variety of crops including rice, grain, tomatoes, field crops, fruits, and nuts. The value of Sacramento Valley crop production reached $1.7 billion in 1992, with rice, tomatoes, and orchard crops providing the highest revenues. The CVP's Tehama-Colusa service area is representative of areas within the region that are heavily dependent on CVP supplies. Districts within the Tehama-Colusa service area hold water service contracts with USBR, making them subject to water delivery curtailments up to 100 percent in dry years. All TCCA member districts rely on CVP service contracts for a portion of their supplies. Twenty-five such districts are located within the Sacramento Valley region. Approximately 10 percent of the applied water within the Sacramento Valley is provided through CVP service contracts.

The service area of the TC and Corning canals lies entirely in the area of origin of the Sacramento River watershed along the westerly side of the Sacramento River valley. Eighteen water districts contract with the federal government for water deliveries from the TC and Corning canals. These districts have contracts totaling 325,000 acre-feet of water each year and provide service to over 150,000 acres of land located in Tehama, Glenn, Colusa, and Yolo counties.

Agricultural districts served by TCCA would benefit from the increased reliability provided by the project.

Power Resources

When California deregulated its energy market, it established the California Power Exchange to operate a power exchange system from which the state's investor-owned utilities (IOU) (Pacific Gas & Electric Company [PG&E], Southern California Edison, and San Diego Gas & Electric) had to buy their power on a day-ahead and day-of basis. The highest-price power supply bid that was needed for the next day set the price for the entire market. The IOUs were also prevented from hedging into future markets. This eliminated bilateral, negotiated agreements from the marketplace.

As power suppliers gained an understanding of the market, the Pacific Northwest began to experience the second driest water year of record, and the supply of natural gas available to California decreased.

This led to a situation where wholesale market prices became volatile and provided opportunities for market manipulation. The California Independent System Operator had responsibility to provide the system with "spinning reserves," which it had to purchase on the spot market, driving wholesale power prices even higher.

In October 2001, the California Public Utilities Company ended direct access in the state, putting a close to California deregulation of electricity markets. The state, through large power purchases during volatile periods of deregulation is now in a position of being a major power purchaser and seller, and longer-term bilateral contracts dominate the market.

In December 2001, Federal Energy Regulatory Commission issued additional extensive orders clarifying the market mitigation framework that exists in California today; this is due to expire on September 30, 2002. Efforts are underway to redesign the California wholesale power market and to extend the present market mitigation framework until a new framework can be put in place.

In May 2002, documents surfaced indicating deliberate market manipulation by various power marketers, which in turn have led to calls for refunds, increased regulatory scrutiny, and perhaps litigation.

USBR's CVP supplies electricity to its individual components (called Project Use) and supplies the excess generation to a number of preference power customers through contractual arrangements with the Western Area Power Administration (Western). USBR's CVP and Washoe Project include 11 power plants with a maximum operating capability of about 2,044 megawatts and an estimated average annual generation of 4.6 million megawatt-hours (MWh). Western markets the remaining power, currently about 1,580 megawatts, to customers in northern and central California.

The first priority for CVP generation is Project Use, defined by USBR law and used to operate the CVP and Washoe Project facilities. It is anticipated that any new electrical load, such as would occur under a new pumping facility, would be supplied with Project Use Power. However, a formal determination regarding Project Use has not been made. If the project were served with CVP power, it would reduce the amount of electricity available for use by Western's preference customers.

Currently, RBDD and associated facilities use about 4,800 MWh per year. Electrical usage would be highest under the Gates-out Alternative, where annual use would increase to

approximately 9,000 MWh per year. This increase in power consumption is considered less than significant, even if it resulted in a decrease in the amount of electricity available to preference power customers.

Socioeconomics

In the 1970s and 1980s, both the City of Red Bluff's and County of Tehama's populations grew more rapidly than other areas of the state. In the 1990s, this trend reversed and the County grew at a rate similar to that of the state, and the City grew more slowly. In fact, the City of Red Bluff grew very slowly in the 1990s; population increased from 12,363 in 1990 to 13,147 in 2000.

In 2000, the civilian labor force in Tehama County was 25,760; about a quarter of those employees (5,580) lived in Red Bluff. In recent years, the unemployment rate has been higher in the County than in the state as a whole. For example, in 1990, the unemployment rate was 10.0 percent in the County versus 5.8 percent statewide; and in 2000, the rates were 6.9 percent and 4.9 percent, respectively.

Total employment grew much more rapidly during the 1990s in Tehama County (31 percent) than did the rest of the state (13 percent). The fastest growing sectors of the local economy are retail, trade, finance, insurance, and real estate. The local economy is highly dependent on agriculture, including forestry. The main cash crops in the County are dried plums, walnuts, dairy and beef cattle, almonds, corn, alfalfa, and olives. Farmland makes up approximately 47 percent of the total acreage in the County.

The Gates-out Alternative would create a number of potential economic impacts. The total of the various impacts of this alternative would result in a significant economic impact to the local community.

The combined impact from reduced recreation and tourism spending and the loss of the Nitro National drag boat races is estimated to be about $4.2 million per year. This is small relative to total annual sales in Tehama County of $1.7 billion, but it would be a more substantial impact to the City of Red Bluff. One measure of this impact would be the resulting loss of sales and use tax revenue of $89,000, which is about 1.9 percent of the City's total revenues from sales and use taxes.

The value of properties adjacent to the lake or with easy access to the lake would likely decline from the loss of the lake. While it is uncertain how large this impact would be, it is expected that, in general, the impact would be in the low end of national estimates of property values with lakeviews and proximity to a lake, resulting in potential decreases of of 4 to 18 percent or roughly $7,000 to $31,000 per property.

Additionally, a noticeable impact to local residents would occur in a number of social aspects such as reduction in the quality of life and reduced community cohesion because of the Gates-out Alternative. No mitigation is available to offset these impacts.

Cultural Resources

Information on cultural resources was collected through a records search, literature review, consultation with agencies, and two archaeological surveys. According to the Northeast Information Center of the California Historical Resources Information System, three early

archaeological inspections were conducted near RBDD, but the files for these surveys are missing; therefore, no information is available. Two prehistoric-period cultural resources, TEH-881 and TEH-882, were identified and recorded within a 0.5-mile radius of the project, but they are not located within the area of potential effect. Accordingly, they are not discussed further. ~~have been identified and recorded within a 0.5-mile radius of the proposed activity area.~~

Two ~~Three unrecorded~~ cultural resources (TEH-59 and TEH-66) located within the area of potential effect ~~proposed activity area~~ were plotted on Information Center maps. ~~All of these resources were noted for additional consideration.~~ The locations of these sites were thoroughly checked during the archaeological surveys. The areas were found to have been substantially modified, and no archeological materials were discovered. Based on the known disturbances to the sites and on the results of the archaeological surveys, it is assumed that these sites do not contain archaeological resources. However, USBR still needs to conclude the Section 106 process for this undertaking and will seek the State Historic Preservation Officer's (SHPO) concurrence that investigations at these sites are sufficient and complete.

In addition, a small, one-room, single-story structure (PA-02-01) was identified within the APE. This small structure is believed to be ineligible for inclusion in the National Register of Historic Places, and USBR will seek the SHPO's concurrence that PA-02-01 is not eligible.

Two additional structures (the Diamond Lumber Mill Site and the Red Bluff Dam and associated Diversion Facility) remain to be recorded and evaluated for possible inclusion in the National Register of Historic Places. If either is determined to be eligible for the National Register of Historic Places, then USBR will apply the criterion of adverse effect and conclude the Section 106 process, as appropriate.

USBR consulted with SHPO regarding this project on May 1, 2002. As described above, consultation with SHPO regarding this project is ongoing.

Any area adjacent to a watercourse is sensitive and may have the potential to contain cultural resources. However, the Tehama County Genealogical and Historical Society noted that they were not aware of any historic resources at the proposed activity area.

Construction activities related to all of the alternatives include excavation and other grading and digging activities. It is possible that currently unidentified cultural resources could be discovered during these activities, and destruction of such resources could result in a significant impact. Mitigation would reduce these impacts to a less than significant level.

Aesthetics and Visual Resources

The Sacramento River is considered an important aesthetic and visual resource for residents of the City of Red Bluff and Tehama County and visitors to the area. The river largely defines the eastern edge of the City, although there are some incorporated areas to the east of the river. Residents and visitors use the river for recreation, both on and adjacent to the river. When the gates are in, the formation of Lake Bluff represents a significant change to some viewers in the feeling of an abundance of water in Red Bluff.

Construction of the Mill Site pump station and conveyance facilities and Auxiliary Water System intake associated with improvements to the left bank fish ladder would be visible from the Sacramento River and the Recreation Area. Construction of all facilities would take roughly 3 years to complete. During the construction period, viewers would experience substantially degraded sites, although some construction activity could be screened from sight by cofferdams. Because of the lengthy duration of construction and the sensitive view area from the Sacramento River and the Recreation Area, impacts to visual resources are considered significant, although temporary.

The fish screen associated with the Mill Site pump station would effectively replace approximately 1,400 linear feet of the bluff on the west side of the Sacramento River, creating an industrial-looking facility in place of a natural feature. Given the size of the new structure and the sensitivity of the viewing location, this project element represents a substantial degradation in the visual quality of the site.

Construction of the bypass channel would be visible from the Sacramento River and from multiple locations within the Recreation Area. Construction of the bypass channel would take roughly 12 months to complete. During the construction period, viewers would experience substantially degraded views, including views of tree and other vegetation removal, channel trenching, temporary spoils piles, large construction equipment, concrete work, rock and gravel placement, and fence installation.

The bypass channel would represent a substantial change to the landscape as viewed from the Sacramento River and throughout the Recreation Area. The bypass channel represents a significant visual intrusion in the midst of a landscape that receives heavy recreational use. Because it crosses the Recreation Area, it effectively creates a visual barrier from one location to another. This visual barrier represents a substantial degradation of the existing visual character of the Recreation Area.

The largest impact to aesthetics would occur under the 2-month Gates-in and Gates-out alternatives. The ultimate effect of the reduced-gate and gates-out alternatives would be the negative aesthetic effect on scenic views, and substantially degraded visual character and quality of the project vicinity as it relates to the Sacramento River in, and upstream from, the project area. This degradation would be particularly evident through the Lower River/Red Bluff Recreation Area, East Sand Slough, and the Middle River reaches. No mitigation is available to offset these impacts.

Air Quality

Currently, Tehama County is not in attainment with the state standard for particulate matter less than 10 microns in diameter (PM_{10}) and ozone. During ground surface preparation for all of the alternatives, most of the PM_{10} emissions would be composed of fugitive dust. Emission sources would include vehicles and construction equipment traveling over dirt surfaces, site clearing, grading, cut-and-fill operations, and wind-blown dust. Short-term impacts with regard to dust generated during construction would be considered potentially significant because of the current exceedances of the state PM_{10} standards. Additionally, the impact on air quality would be temporary but significant for carbon monoxide and nitrogen oxide under all of the alternatives. Construction impacts are

considered to be temporary, and when mitigation is applied, the impacts are considered to be less than significant.

Traffic and Circulation

The roadways affected by the proposed project are maintained by the City of Red Bluff Public Works, Tehama County Public Works, and the California Department of Transportation.

Under the 4-month Improved Ladder and Bypass alternatives, Sale Lane would be significantly impacted by construction traffic. Additionally, under all of the alternatives, Altube Lane would be impacted by construction traffic. Many of the vehicles associated with construction would be heavy-duty trucks, including 20-yard earth-moving trucks, 10-yard concrete trucks, and commuter traffic. Sale Lane and Altube Lane are not designed to accommodate heavy truck traffic, and large construction vehicles could exceed the capacity and damage the surface of these roadways. Mitigation would reduce these impacts to a less than significant level.

Noise

The project is located wholly within Tehama County. The County does not have set standards for construction noise. Installation of sheet piles associated with construction would result in a noticeable effect on nearby businesses and recreational areas, specifically on the area near the Discovery Center.

Environmental Justice

Federal agencies are required to identify and address the disproportionately high and adverse human health or environmental effects of their actions on minorities and low-income populations and communities, as well as the equity of the distribution of the benefits and risks of their decisions.

No definable socioeconomic groups reside in the project area. Construction of the project facilities would offer temporary beneficial impacts to the City and County economies. Local businesses will benefit from increased construction worker patronage, and local companies that become directly involved in portions of the construction effort would benefit from increased business activity.

The bypass channel would be constructed through an active park. The bypass would effectively cut off the Discovery Center and campground from the rest of the park, isolating them and reducing their value as recreational and educational amenities. Although this is not anticipated to have a disproportionate impact on any specific socioeconomic group, it would cause impacts to student groups that use the facility. Thus, impacts would be disproportionately borne by children.

Other Impacts and Commitments

Cumulative Impacts

Cumulative impacts are the impacts on the environment that result from the incremental impacts of the proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or entity undertakes such other actions. The proposed action in the DEIS/EIR may be interactively implemented with other concurrent projects. In addition, those other projects may affect the impacts of the proposed action. This cumulative impact analysis addresses impacts associated with the following related actions:

- Implementation of Central Valley Project Improvement Act (CVPIA)
- State Water Resources Control Board Water Rights Process and CALFED Bay-Delta Program
- Deregulation of Electric Industry in California
- Changes in Demand for Agricultural Products
- Changes to Fisheries Management
- Urbanization
- Changes in Demand for Recreational Opportunities
- Total Maximum Daily Load
- Trinity River Restoration Program (EIS/EIR)
- Sacramento County Municipal and Industrial Water Supply Contracts
- Sacramento River Conservation Area Program (Federal, State, and Local Agencies and Private Interest Groups)
- Stream Restoration and Other Salmonid Habitat Improvements in the Upper Sacramento River
- Integrated Storage Investigations Program, Specifically the North-of-the-Delta Offstream Storage Project

This DEIS/EIR tiers from the CALFED Programmatic EIS/EIR. Cumulate impacts of this project are consistent with impacts disclosed in that document.

Environmental Commitments and Mitigations

Table ES-4 presents significant impacts and potential mitigation.

References

Moyle, P. B., R. M. Yoshiyama, J. E. Williams, and E. D. Wikramanake. 1995. Fish Species of Special Concern in California. Prepared for the State of California Department of Fish and Game, Final Report Contract No. 21281F. June.

California Regional Water Quality Control Board (RWQCB). 1990. Waste Discharge Requirements for Pactiv Company of California, Class III Landfill, Tehama, California. Order No. 91-064. September 12.

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
Fishery Resources			
Native Anadromous Salmonids, Other Native Anadromous Fish, Non-native Anadromous Fish, Resident Native and Non-native Fish			
1A: 4-month Improved Ladder	Construction: Direct and indirect losses of adult and/or juvenile fish would occur during the installation of cofferdams. Adult and juvenile fish may be stranded and lost during dewatering activities. Direct losses and adverse indirect effects would occur from sediment disturbances and turbidity.	Construction: To avoid impacts to the majority of the focus species, sheet pile installation and in-stream heavy equipment activity should occur only during July and August. Dewatered areas would be pumped down with a screened intake. Fish would be removed when water levels within the contained area are suitable for salvage.	Less than significant
1B: 4-month Bypass	Construction: Identical to 4-month Improved Ladder Alternative.	Construction: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2A: 2-month Improved Ladder	Construction: Identical to 4-month Improved Ladder Alternative.	Construction: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2B: 2-month with Existing Ladders	Construction: Identical to 4-month Improved Ladder Alternative.	Construction: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
3: Gates-out	Construction: Identical to 4-month Improved Ladder Alternative.	Construction: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
Water Resources			
Surface-water Hydrology and Management – No negative impacts were identified.			
Surface Water Quality			
1A: 4-month Improved Ladder	Erosion: Construction of the proposed facilities would require extensive grading and excavation. Impacts to surface waters could occur during grading and excavation necessary for construction of the proposed fish ladders, as well as the proposed pumping plant and associated conveyance facilities.	Erosion: To reduce the potential for sedimentation in the Sacramento River or Red Bank Creek to a less than significant level: • Construction contractor shall obtain a General Construction Storm Water Permit, to comply with Clean Water Act Section 402(b) for construction of all facilities. As part of this permit, the contractor shall prepare a Stormwater Pollution Prevention Plan, which would include the following Best Management Practices: – All ground-disturbing activities would be limited to the dry season (mid-May through mid-October) to the extent possible – Vegetation would be left in place to the degree possible to reduce potential sedimentation – All stockpiled material would be placed so that potential erosion is minimized – Filter fabric, straw bales, and/or sediment basins would be used to reduce erosion and the potential for in-stream sedimentation	Less than significant

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
		– Seeding and re-vegetation would be initiated as soon as possible (timed properly to coincide with fall/winter precipitation) after construction completion	
1A: 4-month Improved Ladder	Hazardous Materials: Construction efforts would include use of materials and equipment that require hazardous materials. Examples include diesel fuel and cleaning solvents. Although not intentional, it is possible that the use and handling of hazardous materials could result in spills that could impact nearby waterways.	Hazardous Materials: Implementation of construction Best Management Practices and development of a Spill Prevention Control and Countermeasures would minimize the risk of an uncontrolled spill and consequent contamination. The identification of staging areas for fueling and maintenance of heavy equipment would limit potential spills to designated areas where observation and cleanup could be readily accomplished. Should an oil or fuel spill occur during construction or maintenance activities, all work would cease immediately, the Central Valley RWQCB, CDFG, and USBR would be notified immediately if the quantity of the spill were above state and/or federal reporting requirements; and cleanup procedures would begin immediately.	Less than significant
1B: 4-month Bypass	Erosion and Hazardous Materials: Identical to 4-month Improved Ladder Alternative.	Erosion and Hazardous Materials: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2A: 2-month Improved Ladder	Erosion and Hazardous Materials: Identical to 4-month Improved Ladder Alternative.	Erosion and Hazardous Materials: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2B: 2-month with Existing Ladders	Erosion and Hazardous Materials: Identical to 4-month Improved Ladder Alternative	Erosion and Hazardous Materials: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
3: Gates-out	Erosion and Hazardous Materials: Identical to 4-month Improved Ladder Alternative.	Erosion and Hazardous Materials: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
Groundwater Quality			
1A: 4-month Improved Ladder	Contaminants: Soil contamination at the Pactiv site represents potential impacts to local groundwater resources if contaminated soil is allowed to come in contact with groundwater as a result of project construction activities. Additionally, leaching of soluble or mobile contaminants from soil to groundwater may occur over time if contaminated soil is stockpiled onsite for a long period of time or relocated to a disposal area onsite, through infiltration and other transport processes.	Contaminants: In the event that contaminated soil is encountered, the contractor shall follow and comply with all applicable federal, state, and local regulations. Soil should be removed immediately from the project area, and taken to an appropriate disposal area. If soil should be temporarily stockpiled in the project area, an impermeable liner should be used to prevent direct contact with non-contaminated areas. The following mitigation measures would reduce the potential for contamination in groundwater in the proposed project area to a less than significant level: • Construction contractor shall obtain a General Construction Storm Water Permit, to comply with Clean Water Act Section 402(b) for construction of all facilities. As part of this permit, the contractor shall prepare a Stormwater Pollution Prevention Plan, which would include the following Best Management Practices:	Less than significant

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
		– All ground-disturbing activities would be limited to the dry season (mid-May through mid-October) to the extent possible – All stockpiled material would be placed so that potential erosion and contamination is minimized. Methods shall include, but not be limited to: – Covering the stockpile with plastic sheeting or tarps – Installing a berm around the stockpile to prevent runoff from leaving the area – Planting temporary vegetation if stockpiled material would be kept onsite for a longer duration	
1B: 4-month Bypass	Contaminants: Identical to 4-month Improved Ladder Alternative.	Contaminants: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2A: 2-month Improved Ladder	Contaminants: Identical to 4-month Improved Ladder Alternative.	Contaminants: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2A: 2-month Improved Ladder	Groundwater Quality: The reduced-gates alternative would result in a reduction in the amount of time Lake Red Bluff would be formed. This would ultimately change seasonal elevations of ground-water in the project area. There is some potential that additional wells may exist in the vicinity of Lake Red Bluff that have not been identified during the development of this EIR. Wells that depend on the additional groundwater recharge and head provided by Lake Red Bluff could require alternate water supplies if the gates remain out during the dry season. However, because the gates are currently out most of the year, wells in the aquifer areas influenced by the filling of Lake Red Bluff are probably already designed to supply water regardless of gate position.	Groundwater Quality: If it is determined that wells in the project area are affected by the seasonal fluctuation of Lake Red Bluff, these wells could be relocated or extended to greater depths to meet continuous or seasonal water demands.	Less than significant
2B: 2-month with Existing Ladders	Contaminants: Identical to 4-month Improved Ladder Alternative.	Contaminants: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2B: 2-month with Existing Ladders	Groundwater Quality: Identical to 2-month Improved Ladder Alternative.	Groundwater Quality: Mitigation identical to 2-month Improved Ladder Alternative.	Less than significant
3: Gates-out	Contaminants: Identical to 4-month Improved Ladder Alternative.	Contaminants: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
3: Gates-out	Groundwater Quality: Identical to 2-month Improved Ladder Alternative.	Groundwater Quality: Mitigation identical to 2-month Improved Ladder Alternative.	Less than significant
	Biological Resources		
Wildlife Habitat			
1A: 4-month Improved Ladder	Riparian Habitat: Up to 7.74 acres of riparian habitat would be impacted, including the permanent loss of 2.18 acres for the access bridge, the conveyance pipeline, left fish ladder, and the fish screen and forebay. An additional 5.56 acres of riparian habitat could be removed for construction activities for the forebay/conveyance and left fish ladder.	Riparian Habitat: To the extent possible, areas of riparian vegetation temporarily disturbed during construction would be planted with native riparian trees and shrubs following construction. The permanent removal of riparian vegetation would be mitigated by creating riparian habitat at 3:1 ratio for the impacted acreage. TCCA and USBR would work with CDFG and USFWS to identify sites.	Less than significant
1A: 4-month Improved Ladder	Freshwater Marsh Habitat: At least 0.05 acre of freshwater marsh habitat would be permanently lost with construction of the conveyance pipeline and access bridge. An additional 0.71 acre of freshwater marsh are within the 200-foot construction area and could be impacted, for a total of 0.76 acre.	Freshwater Marsh Habitat: To the extent possible, areas of freshwater marsh temporarily disturbed during construction would be planted with native riparian trees and shrubs following construction. The permanent removal of freshwater marsh would be mitigated by creating freshwater marsh at a 3:1 ratio for the impacted acreage. TCCA and USBR would work with CDFG and USFWS to identify appropriate sites.	Less than significant
Special-status Species			
1A: 4-month Improved Ladder	VELB: VELB are entirely dependent on the elderberry shrub. The six elderberry shrubs and/or groups of shrubs identified in the project area are within the 200-foot buffer area considered to be temporarily impacted in this analysis. Removal of the elderberry shrubs under this alternative has the potential to adversely affect the federal-listed VELB.	VELB: TCCA and USBR would attempt to avoid elderberry shrubs in locating staging areas, access roads, and other construction areas. Shrubs that can be avoided would be fenced and posted, and workers would be educated about VELB in accordance with the Conservation Guidelines. If elderberry shrubs cannot be avoided, they would be transplanted, and additional seedlings would be planted at a secure mitigation site in accordance with the Conservation Guidelines. Section 7 consultation with USFWS has been concluded with the issuance of a Biological Opinion.	Less than significant
Other Special-status Species			
1A: 4-month Improved Ladder	Osprey: The three osprey nest platforms on the south side of the Sacramento River would need to be removed during construction.	Osprey: Prior to the start of construction activities, all three~~the two~~ platforms that can support~~ing~~ osprey nesting would be removed. TCCA and USBR would work with CDFG to identify nearby location(s) to erect two platforms to serve as replacement nesting sites. The relocated platforms would be installed concurrently with the removal of the existing platforms and be completed prior to the start of the nesting season.	Less than significant
	Bats: Three bat species were visually confirmed, and a fourth species was acoustically detected in the project vicinity. Numerous roost locations were documented in the two abandoned storage buildings at the Mill Site. Evidence was found that bats roost	Bats: Exclusion and Building Removal: If the current project plans are modified and the buildings were to be demolished, impacts would be considered to be permanent and significant. Removal of the abandoned buildings would displace hundreds and possibly thousands of bats and be a significant	

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
	in some of the hydroelectric structures of RBDD in concrete weep holes and under metal overhangs. Several areas appeared to provide potential roosting and foraging habitat. The two abandoned buildings used as bat roosts are within the 200-foot buffer area. There are no plans to remove these buildings. No significant impacts to bats would occur. If at the time of project construction a decision is made to permanently impact the roosting habitat by removing the buildings, bats would be significantly impacted, and appropriate mitigation for exclusion of bats from the habitat would be prescribed. For detailed mitigation measures refer to Appendix F. To further ensure that there would be no significant impact, a 25-foot buffer area would be demarcated and flagged around the buildings. No construction activities would occur within this area. Construction materials would not be stored in the buildings occupied by bats, nor would workers enter the buildings. If these avoidance measures are not possible, TCCA would work with CDFG to coordinate an appropriate avoidance measure.	loss of roosting habitat. The species currently identified are colonial, and displacement from the roosts may disrupt colony cohesion. Displaced bats may roost in exposed locations and be at increased risk of predation. If the buildings are to be removed, prior mitigation in the form of exclusion would be performed. Exclusion consists of two phases: allowing emergence while temporarily blocking re-entry for 1 week, followed by permanently blocking the roost entrances. Surveys must be conducted to ensure that all bats have exited the roost before the entrances are permanently blocked to avoid direct mortality by entombment. It is vital that exclusion only be performed in the winter (November through February) after any young of the year are mature. A qualified nuisance control professional should perform the exclusion. A qualified biologist should monitor the bats during the procedures to prevent any mortalities from bats becoming entangled in the netting, and to conduct surveys to ensure that bats are successfully excluded. With these mitigation measures, impacts to bats would be less than significant. Provision of Alternate Roosting Habitat: To mitigate for the loss of roosting habitat, provision of alternate roosting habitat in the form of offsite installation of large bat houses is recommended. Large bat houses (bat condos) may be erected. Bat condos are similar to raised wooden chicken coops with internal partitions to form roost crevices. The overall size should be 8 x 8 x 8 feet, and the width of the internal partitions should be approximately 0.75 to 1.0 inch for the free-tail bats and also 1.0 to 1.5 inches for the pallid bats. Bat condos should be oriented properly (usually southern or southeastern exposure), and the temperature regime and humidity inside the condo should replicate that found in the original roosts. It is recommended that the existing exterior wall of the abandoned storage building located at the Mill Site with the plywood-backed louvers be reconstructed in a suitable offsite location to provide for myotis bat roosting habitat. Alternately, bat houses mounted on poles may be erected that simulate the existing roost (the gap under the loose board attached to a pole). Managers at the Recreation Area are currently experimenting with bat house style and placement and may provide a cooperative bat management opportunity. With these mitigation measures, impacts to bats would be less than significant.	

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
Wildlife Habitat			
1B: 4-month Bypass	Riparian Habitat: Approximately 8.9 acres of riparian habitat would be permanently or temporarily removed. This includes the permanent loss of 2.6 acres of riparian habitat with land conversion resulting from installation of the bypass, access bride, conveyance pipeline, and the fish screen and forebay. Up to an additional 6.3 acres of riparian habitat could be removed to accommodate construction activities required for the bypass work area and the forebay/conveyance and right fish ladder work areas. These impacts would constitute a temporary impact. Following completion of construction, temporarily impacted areas of riparian habitat would be planted with native riparian tress and shrubs to restore the habitat.	Riparian Habitat: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
1B: 4-month Bypass	Freshwater Marsh Habitat: Identical to 4-month Improved Ladder Alternative.	Freshwater Marsh Habitat: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
1B: 4-month Bypass	Restored Habitat: Under this alternative, 9.76 acres of restored habitat would be impacted. Because the restored habitat was created as mitigation for removal of riparian habitat and/or oak woodland elsewhere, its removal would result in inadequate mitigation for the previous impact. Therefore, removal of restored habitat under this alternative is a significant impact.	Restored Habitat: To the extent possible, restored habitat disturbed during construction would be planted with similar trees and shrubs to restore the impacted habitat following construction. The permanent removal of restored habitat would be mitigated by creating restored habitat at a 3:1 ratio for the impacted acreage. TCCA and USBR would work with CDFG and USFWS to identify appropriate locations for restored habitat. With this mitigation, the impacts to restored habitat would be less than significant.	Less than significant
Special-status Species			
1B: 4-month Bypass	VELB: Identical to 4-month Improved Ladder Alternative.	VELB: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
Other Special-status Species			
1B: 4-month Bypass	Osprey and Bats: Identical to 4-month Improved Ladder Alternative.	Osprey and Bats: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
Wildlife Habitat			
2A: 2-month Improved Ladder	Riparian Habitat: Up to 7.74 acres of riparian habitat would be impacted, including the permanent loss of 2.18 acres for the access bridge, the conveyance pipeline, left fish ladder, and the fish screen and forebay. An additional 5.56 acres of riparian habitat could be removed for construction activities for the forebay/conveyance and left fish ladder.	Riparian Habitat: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2A: 2-month Improved Ladder	Freshwater Marsh Habitat: Identical to 4-month Improved Ladder Alternative.	Freshwater Marsh Habitat: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
Special-status Species			
2A: 2-month Improved Ladder	VELB: Identical to 4-month Improved Ladder Alternative.	VELB: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
Other Special-status Species			
2A: 2-month Improved Ladder	Osprey and Bats: Identical to 4-month Improved Ladder Alternative.	Osprey and Bats: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
Wildlife Habitat			
2B: 2-month with Existing Ladders	Riparian Habitat: Up to 6.81 acres of riparian habitat would be impacted, including the permanent loss of 2.05 acres of riparian habitat for installation of the access bridge, the conveyance pipeline, and the fish screen and forebay, all on the south side of the river. Up to an additional 4.76 acres of riparian habitat could be temporarily removed to accommodate construction activities.	Riparian Habitat: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2B: 2-month with Existing Ladders	Freshwater Marsh Habitat: Identical to 4-month Improved Ladder Alternative.	Freshwater Marsh Habitat: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
Special-status Species			
2B: 2-month with Existing Ladders	VELB: Identical to 4-month Improved Ladder Alternative	VELB: Mitigation identical to 4-month Improved Ladder Alternative.	
Other Special-status Species			
2B: 2-month with Existing Ladders	Osprey and Bats: Identical to 4-month Improved Ladder Alternative.	Osprey and Bats: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
Wildlife Habitat			
3: Gates-out	Riparian Habitat: Identical to 2-month with Existing Ladders Alternative.	Riparian Habitat: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
3: Gates-out	Freshwater Marsh Habitat: Identical to 4-month Improved Ladder Alternative.	Freshwater Marsh Habitat: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
Special-status Species			
3: Gates-out	VELB: Identical to 2-month with Existing Ladders Alternative.	VELB: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
Other Special-status Species			
3: Gates-out	Osprey and Bats: Identical to 4-month Improved Ladder Alternative.	Osprey and Bats: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
		Recreation	
1B: 4-month Bypass	New Pump Station, Right Bank Fish Ladder, Conveyance Facility, and Bypass Channel: Temporary construction-related impacts associated with the 4-month Bypass Alternative include all impacts identified for the 4-month Improved Ladder Alternative and those noted below. Temporary impacts from construction of the bypass channel include: • Extensive excavation and earthmoving equipment within the Recreation Area. • Limited access to the Discovery Center/Charter School. • Limited access to the USFS/Sycamore Grove Campground. • The relocation of Sale Lane and the USFS/Sycamore Grove Campground Road. • Removal of approximately 10 camping spaces at the Sycamore Grove Campground. • Construction-related traffic increase on Sale Lane. • Construction of an access bridge over the bypass channel. • Construction of security fencing around the bypass channel.	New Pump Station, Right Bank Fish Ladder, Conveyance Facility, and Bypass Channel: Mitigation options to address the temporary construction-related impacts include: • Use the latest construction techniques to minimize impacts (i.e., noise blankets for pile-driving operations). • Conduct an ongoing public information campaign targeted at area recreation users. This campaign would provide information on construction activities/impacts as well as information on temporary alternate recreation sites. • Maintain temporary access for vehicles, pedestrians, and cyclists to all Recreation Area facilities throughout construction. • Maintain the existing access to the Discovery Center with the construction of a bridge. • Create a new alignment of Sale Lane to access the boat ramp south of RBDD. • Design security fencing in conjunction with USFS to be minimally intrusive in size, location, color, and materials. Alternative security measures would be investigated, such as use of rock walls or other natural materials to address safety issues around the bypass channel. • Develop 10 new campsites and all supporting infrastructure (roads/trails and utilities) at an alternate location to offset those lost during construction.	Significant

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
1B: 4-month Bypass	Mill Site Pumping Station and Bypass Channel: The Recreation Area would be directly impacted by the alignment of the bypass channel bisecting a portion of the property. The construction and operations of the bypass channel would result in the following: • Loss of restored riparian woodlands for recreation and educational/interpretative uses in the Recreation Area. • Creation of a physical barrier between the Sacramento River Discovery Center/Charter School, Sycamore Grove Campground, and the remainder of the Recreation Area. • Loss of 10 camping spaces at Sycamore Grove Campground. • Construction of security fencing around the bypass channel impacting the experience of visitors to the Recreation Area. • Limiting pedestrian and cycling access between the portions of the Recreation Area separated by the bypass channel to two crossings–one adjacent to a new bridge on Sale Lane crossing the channel and the second a footbridge east of the current Sycamore Grove campsites. The associated loss of riparian woodlands for educational/interpretive uses is in conflict with the Lake Red Bluff FEIS. The Lake Red Bluff FEIS stresses the importance of recreational uses in concert with the restoration of riparian habitat and public education of the area's natural environment.	Mill Site Pumping Station and Bypass Channel: Mitigation options to address the permanent operations-related impacts include: • Provide permanent access for vehicles, pedestrians, and cyclists to all Recreation Area facilities with an access bridge and pedestrian/cyclist bridge. • Incorporate extensive natural landscaping into the final construction of the bypass channel to blend the new construction with the surrounding riparian area. • Maintain the existing access to the Discovery Center with the construction of a bridge. • Create a new alignment of Sale Lane to access the boat ramp south of RBDD. • Design security fencing in conjunction with USFS to be minimally intrusive in size, location, color, and materials. Alternative security measures would be investigated, such as use of rock walls or other natural materials to address safety issues around the bypass channel. • Develop 10 new campsites at an alternate location to offset those lost during construction. • Use the bypass channel as an educational/interpretive element of the Recreation Area. This may include the development of fish-viewing locations along the bypass channel.	Significant
2A: 2-month Improved Ladder	Adjusted Gates-in Period: Recreational activities that would experience limitations associated with the loss of Lake Red Bluff for 2 additional months include: • Motor boating • Jet skiing • Swimming • Water skiing • Boat racing	Adjusted Gates-in Period: Mitigation options to address the permanent operations-related impacts include: • Facilitate the development and implementation of a plan with the City of Red Bluff, Tehama County, local business organizations, appropriate permitting agencies, and local citizens groups to phase in the gate operations changes over a period of 5 years to: – Allow the community to transition lake-dependent recreation activities to other opportunities.	Significant

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
	While recreational motor boating and jet skiing are possible on the Sacramento River during the gates-out period, the available water area is considerably reduced for the 2 additional gates-out months. Therefore, less time is available for these activities. Swimming is possible, but unlikely in the cold Sacramento River water. Boat racing and water skiing are not feasible during the additional 2-month gates-out period. The activities are lake- dependent activities and would assume the greatest impact. The Nitro National drag boat races could not be held over the Memorial Day holiday weekend.	– Identify specific activities and events through the facilitated planning process with local stakeholders. • Facilitate the development of non-lake dependent recreational activities as part of the planning process mentioned above. This may include, but is not limited to: – Cooperating on the implementation of recreational trail plans. – Cooperating on the rehabilitation and expansion of existing area recreational parkland or facilities. – Facilitating identification and acquisition of future recreational parkland. • Facilitate the creation of other recreation-oriented events as part of the planning process mentioned above. This may include, but is not limited to: – Facilitating the rescheduling of the Nitro National Drag Boat Festival. – Facilitating the development of a land- or river-based festival event (river sports, and fishing) of similar size/impact as the Nitro National Drag Boat Festival.	
2B: 2-month with Existing Ladders	Adjusted Gates-in Period: Identical to 2-month Improved Ladder Alternative.	Adjusted Gates-in Period: Mitigation identical to 2-month Improved Ladder Alternative.	Significant
3: Gates-out	Gates-out Year-round: Recreational activities would experience limitations or elimination as a result of the loss of Lake Red Bluff, including: **Limited:** • Swimming • Jet skiing • Motor boating **Eliminated:** • Water skiing • Boat racing The Nitro National drag boat races, traditionally held on Lake Red Bluff over the Memorial Day holiday weekend, would not be viable at its current location. The drag boat race would either move to another	Gates-out Year-round: Mitigation identical to 2-month Improved Ladder Alternative (Adjusted Gates-in Period).	Significant

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
	location or be replaced with another race in another location. Many stakeholders have expressed the importance of this high-profile event as a critical recreational opportunity in Red Bluff. The activities listed are characterized as lake-dependent activities and would assume the greatest impact as a result of this alternative.		
		Land Use	
1B: 4-month Bypass	Sycamore Grove Campground: Temporary and permanent construction-related impacts would also occur to the use of the Sycamore Grove Campground facilities located in the Recreation Area. Construction vehicles would need access to the campground area to construct the lower end of the channel. Approximately 10 camping facilities would be ~~permanently~~ removed as a result of construction of the bypass channel. A new road would need to be constructed to maintain access to the remaining camping facilities.	~~Sycamore Grove Campground: No mitigation is available.~~Although the loss of 10 campsites from Sycamore Campground is unavoidable, construction of replacement campsites (Mitigation 1B-R1), including supporting infrastructure, would mitigate the impact.	Significant
1B: 4-month Bypass	Discovery Center: Temporary impacts would occur as a result of construction to the use of the Discovery Center. Schools from the area make daily trips to the center during the spring months. If construction of the bypass channel were to occur during the springtime, access to the valley oak, western red bud, California native sycamore, and Fremont cottonwood plantings would be blocked. This would conflict with the riparian and oak lessons and hikes that occur with the daily trips.	Discovery Center: No mitigation is available.	Significant
1B: 4-month Bypass	Recreation Area: Construction of the bypass channel does not comply with the current management direction in the Mendocino National Forest Land and Resource Management Plan.	Recreation Area: Amendment of the Mendocino National Forest Land and Resource Management Plan under the~~is~~ alternative would eliminate conflict with current ~~reconcile~~ management direction in the Mendocino National Forest Land and Resource Management Plan ~~with the new situation, but would not avoid the impacts~~.	Significant
2A: 2-month Improved Ladder	Boat Docks and Ramps: Permanent impacts would occur to the use of public and private boat docks and ramps located on Sacramento River. Public and private boat docks and ramps currently existing along the shoreline of the river would not properly function when the gates are in the up position;	Boat Docks and Ramps: No mitigation is available.	Significant

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
	therefore, they would be unusable for 2 additional months.		
2B: 2-month with Existing Ladders	Boat Docks and Ramps: Identical to 2-month Improved Ladder Alternative.	Boat Docks and Ramps: No mitigation is available.	Significant
3: Gates-out	Boat Docks and Ramps: Permanent impacts would occur to the use of public and private boat docks and ramps located on Sacramento River. Public and private boat docks and ramps currently existing along the shoreline of the river would not properly function when the gates are in the up position. These boat docks and ramps would no longer access the lower elevations of the river in its natural, free-flowing state.	Boat Docks and Ramps: No mitigation is available.	Significant
		Geology	
1A: 4-month Improved Ladder	Excavation: Approximately 800,000 CY of material would need to be excavated. Approximately 600,000 CY of this material would be stored onsite.	Excavation: To minimize soil erosion, movement of sediments, loss of topsoil, and associated water quality impacts, an approved drainage, grading, and erosion control plan would be completed prior to construction. This plan would meet all local requirements and incorporate construction site Best Management Practices to stabilize areas cleared of vegetation and soil stockpiles. Best Management Practices may include preservation of existing vegetation, silt fences, and/or straw bales. Covering soil stockpiles with mulch or matting as well as continuous maintenance of erosion control measures would be necessary. Timely re-vegetation of disturbed sites would minimize post-construction erosion impacts.	Less than significant
1B: 4-month Bypass	Excavation: Identical to 4-month Improved Ladder Alternative.	Excavation: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2A: 2-month Improved Ladder	Excavation: Identical to 4-month Improved Ladder Alternative.	Excavation: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2B: 2-month with Existing Ladders	Excavation: Approximately 750,000 CY of material would need to be excavated to complete construction of this alternative. The primary excavation for this alternative is required to construct the Mil Site pump station and conveyance facilities. Approximately 580,000 CY of this material would remain onsite.	Excavation: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
3: Gates-out	Excavation: Identical to 4-month Improved Ladder Alternative.	Excavation: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
Agricultural Resources – *No negative impacts were identified.*			
Power Resources – *No significant impacts were identified.*			
Socioeconomic			
3: Gates-out	Fish Runs/Spending/Property Value/Quality of Life and Community Cohesion: Although there have been gradual reductions in the amount of time the lake has been available each year, the total loss of Lake Red Bluff would have much more dramatic effects on the local economy than those in recent history. The sum total of the various impacts of this alternative would result in a significant economic impact to the local community. The potential for positive economic impact is uncertain and should be viewed as speculative at this stage of analysis. The combined impact from reduced recreation and tourism spending and from the loss of the Nitro National drag boat races is estimated to be about $4.2 million per year. This is small relative to total annual sales in Tehama County of $1.7 billion, but it would be a more substantial impact to the City of Red Bluff. One measure of this impact is the resulting loss of sales and use tax revenue of $89,000, which is about 1.9 percent of the City's total revenues from sales and use taxes. It is likely that the value of properties adjacent to the lake or with easy access to the lake would decline from the loss of the lake. While it is uncertain how large this impact would be, it is expected that, in general, the impact would be in the low end of national estimates of the value of lake views and proximity of 4 to 18 percent. This alternative would also result in a noticeable impact to local residents in a number of social aspects such a reduction in the quality of life and reduced community cohesion. Even though these impacts are hard to quantify, they are nonetheless real impacts to the local community.	Fish Runs/Spending/Property Value/Quality of Life and Community Cohesion: No mitigation is available.	Significant

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
		Cultural Resources	
1A: 4-month Improved Ladder	Unidentified Cultural Resources: Construction activities include excavation and other grading and digging activities. It is possible that currently unidentified cultural resources could be discovered during these activities, and destruction of such resources could result in a significant impact.	Unidentified Cultural Resources: If during construction activities, ~~unusual~~ amounts of non-native stone, bone, shell, or prehistoric or historic period artifacts are discovered, or if areas that contain dark-colored sediment that do not appear to have been created through natural processes are discovered, then work would cease in the immediate area of discovery, and USBR's Contract Inspector and the USBR Regional Archaeologist ~~a professionally qualified archeologist~~ would be contacted immediately for an onsite inspection of the discovery. USBR would consult with the SHPO pursuant to 36 CFR 800.13 to evaluate the find, assess the project's effects on the find, and resolve any potential adverse effects. ~~If any bone is uncovered that appears to be human, the Tehama County Coroner would be contacted. If the coroner determines the bone most likely represents a Native American interment, the coroner would contact the Native American Heritage Commission in Sacramento for identification of the most likely descendants. Implementation of this mitigation would reduce potentially significant impacts to a less than significant level.~~ If any bone is uncovered from private land that appears to be human, the Tehama County coroner would be contacted, according to state law. If the coroner determines that the bone most likely represents a Native American interment, the coroner would contact the Native American Heritage Commission for identification of the most likely descendants. In the event that human remains or cultural items are discovered on USBR lands, then all work should cease in the vicinity of the discovery, and the requirements of the Native American Graves Protection and Repatriation Act and Reclamation Directives and Standards LND 07-01 shall be implemented and followed.	Less than significant
1B: 4-month Bypass	Unidentified Cultural Resources: Identical to 4-month Improved Ladder Alternative.	Unidentified Cultural Resources: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2A: 2-month Improved Ladder	Unidentified Cultural Resources: Identical to 4-month Improved Ladder Alternative.	Unidentified Cultural Resources: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2B: 2-month with Existing Ladders	Unidentified Cultural Resources: Identical to 4-month Improved Ladder Alternative.	Unidentified Cultural Resources: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
3: Gates-out	Unidentified Cultural Resources: Identical to 4-month Improved Ladder Alternative.	Unidentified Cultural Resources: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
		Aesthetics	
1A: 4-month Improved Ladder	Construction Views of Mill Site: Construction of all facilities would take roughly 3 years to complete. During the construction period, viewers would experience substantially degraded sites, although some construction activity may be screened from sight by cofferdams.	Construction Views of Mill Site: No mitigation is available.	Significant
1A: 4-month Improved Ladder	Permanent Landscape Changes from Operations: Represents a substantial change to the landscape as viewed from the Sacramento River and the Recreation Area. Given the size of the new structure and the sensitivity of the viewing location, operation of these facilities represents a substantial degradation of the visual quality of the site.	Permanent Landscape Changes from Operations: To help mitigate visual impacts, a committee would be formed following selection of a Preferred Alternative to develop measures intended to help the new facility blend with the surrounding environment. Potential measures include selection of a concrete color and a finish for the fish screen panels (if available). The committee to evaluate visual resources mitigation measures would be based on the existing Stakeholder Working Group.	Significant
1B: 4-month Bypass	Construction Views of Mill Site: Identical to 4-month Improved Ladder Alternative.	Construction Views of Mill Site: No mitigation is available.	Significant
1B: 4-month Bypass	Construction View of Bypass Channel: Construction of the bypass channel would take roughly 12 months to complete. During the construction period, viewers would experience substantially degraded views, including views of tree and other vegetation removal, channel trenching, temporary spoils piles, large construction equipment, concrete work, rock and gravel placement, and fence installation. Because of the sensitivity of the construction area and the number of recreational viewers in the immediate vicinity of construction, construction of the bypass pipeline would substantially degrade the visual character and quality of the site and its surroundings.	Construction Views of Bypass Channel: No mitigation is available.	Significant
1B: 4-month Bypass	Permanent Landscape Changes from Operations: Identical to 4-month Improved Ladder Alternative.	Permanent Landscape Changes from Operations: Mitigation identical to 4-month Improved Ladder Alternative.	Significant
1B: 4-month Bypass	Permanent Landscape Changes from Bypass Channel: The bypass channel would represent a substantial change to the landscape as viewed from the Sacramento River and throughout the Recreation Area.	Permanent Landscape Changes from Bypass Channel: To help mitigate visual impacts, a committee would be formed following selection of a Preferred Alternative to develop measures intended to help the bypass channel blend with the surrounding environment. Potential measures include selection of fencing material and landscaping around the channel.	Significant

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
	Regardless of the location from which the bypass channel is viewed, it represents a significant visual intrusion in the midst of a landscape that receives heavy recreational use. Because it crosses the Recreation Area, it effectively creates a visual barrier from one location of the Recreation Area to another. This visual barrier represents a substantial degradation of the existing visual character of the Recreation Area.	The committee to evaluate visual resources mitigation measures would be based on the existing Stakeholder Working Group.	
2A: 2-month Improved Ladder	Construction Views of Mill Site: Identical to 4-month Improved Ladder Alternative.	Construction Views of Mill Site: No mitigation is available.	Significant
2A: 2-month Improved Ladder	Permanent Landscape Changes from Operations: Identical to 4-month Improved Ladder Alternative.	Permanent Landscape Changes from Operations: Mitigation identical to 4-month Improved Ladder Alternative.	Significant
2A: 2-month Improved Ladder	Permanent Landscape Changes from Reduction of Gates-in Period: Under the 2-month Improved Ladder Alternative, the RBDD gates would remain in the up position for an additional 2 months, reducing the gates-in period from 4 months each year to 2 months each year. Because the quality of some of the views within the Middle River reach are considered moderate under the gates-out condition and moderately high under the gates-in condition, an increase in the gates-out condition may be considered to be a substantial degradation of the visual quality of the Middle River reach.	Permanent Landscape Changes from Reduction of Gates-in Period: No mitigation is available.	Significant
2B: 2-month with Existing Ladders	Construction Views of Mill Site: Identical to 4-month Improved Ladder Alternative.	Construction Views of Mill Site: No mitigation is available.	Significant
2B: 2-month with Existing Ladders	Permanent Landscape Changes from Operations: Identical to 4-month Improved Ladder Alternative.	Permanent Landscape Changes from Operations: Mitigation is identical to 4-month Improved Ladder Alternative.	Significant
2B: 2-month with Existing Ladders	Permanent Landscape Changes from Reduction in Gates-in Time Period: Visual quality impacts are identical to 2-month Improved Ladder.	Permanent Landscape Changes from Reduction in Gates-in Time Period: No mitigation is available.	Significant
3: Gates-out	Construction Views of Mill Site: Identical to 4-month Improved Ladder Alternative.	Construction Views of Mill Site: No mitigation is available.	Significant
3: Gates-out	Permanent Landscape Changes from Operations: Identical to 4-month Improved Ladder Alternative.	Permanent Landscape Changes from Operations: Mitigation is identical to 4-month Improved Ladder Alternative.	Significant

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
3: Gates-out	Permanent Landscape Changes from Elimination of Gates-in Period: The impacts to visual resources resulting from the Gates-out Alternative would be the same as those described for the 2-month Improved Ladder Alternative. Because the change from the gates-in to gates-out appearance would be permanent, the ultimate effect of the Gates-out Alternative would be to have negative aesthetic effects on scenic views and to substantially degrade the existing visual character and quality of the project vicinity. This degradation would be particularly evident through the Lower River/Red Bluff Recreation Area, East Sand Slough, and the Middle River reach. Therefore, the impact of eliminating the annual gates-in period would be considered significant.	Permanent Landscape Changes from Elimination of Gates-in Period: To help mitigate visual impacts, a committee would be formed following selection of a Preferred Alternative to develop measures intended to help improve the appearance of those areas through the Sacramento River reaches that are particularly impacted by the loss of Lake Red Bluff. Potential measures include natural vegetation or landscaping through the east bank of the river adjacent to the Recreation Area and the East Sand Slough, and the creation of shallow lagoons or ponds adjacent to the Recreation Area and the City Park. The committee to evaluate visual resources mitigation measures would be based on the existing Stakeholder Working Group.	Significant
		Air Quality	
1A: 4-month Improved Ladder	Fugitive Dust Emissions: During ground surface preparation, most of the PM_{10} emissions would be composed of fugitive dust. Short-term impacts with regard to dust generated during construction would be considered potentially significant because of the current exceedance of the state PM_{10} standards~~.~~ however, when standard fugitive dust mitigation measures are applied, PM_{10} construction impacts would be less than significant.	Fugitive Dust Emissions: A ~~dust control program~~ fugitive-dust emissions plan would be implemented in accordance with Tehama County Air Pollution Control District Rule 4:24. It would include ~~with~~ the following components: • Equipment and manual watering would be conducted on all stockpiles, dirt/gravel roads, and exposed or disturbed soil surfaces, as necessary, to reduce airborne dust. • The contractor or builder would designate a person to monitor the dust control program and to order increased watering, as necessary, to prevent transport of dust offsite. This person would respond to citizen complaints. • Dust-producing activities would be suspended when high winds create construction-induced visible dust plumes moving beyond the site in spite of dust control. • All trucks hauling soil and other loose material would be covered, or would be required to have at least 2 feet of freeboard. • All unpaved access roads and staging areas at construction sites would have soil stabilizers applied as necessary. • Streets in and adjacent to construction area would be kept swept and free of visible soil and debris. • Traffic speeds on all unpaved roads would be limited to 15 miles per hour.	Less than significant

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
1A: 4-month Improved Ladder	Construction Exhaust Emissions: Fugitive dust impacts are significant during construction, but after mitigation is applied they are reduced to a level of less than significant. PM_{10}, NO_x, and VOC are significant during construction, but after mitigation is applied they are reduced to a level of less than significant. Operations-related impacts are less than significant. ~~Total daily emission levels of 777.82 lb/day of CO and 238.84 lb/day Nox would exceed their respecttive significance thresholds of 550 lb/day and 219 lb/day set in the National Ambient Air Quality Standards.~~	Construction Exhaust Emissions: An equipment control program would be implemented with the following components: • Properly maintain equipment. • Limit idling time when equipment is not in operation.	Less than significant
1B: 4-month Bypass	Fugitive Dust Emissions: Identical to 4-month Improved Ladder Alternative.	Fugitive Dust Emissions: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
1B: 4-month Bypass	Construction Exhaust Emissions: Fugitive dust impacts are significant during construction, but after mitigation is applied they are reduced to a level of less than significant. PM_{10}, NO_x, and VOC are significant during construction, but after mitigation is applied they are reduced to a level of less than significant. Operations-related impacts are less than significant. ~~Total daily emission levels of 1,147.57 lb/day of CO and 352.45 lb/day Nox would exceed their respective significance thresholds of 550 lb/day and 219 lb/day set in the National Ambient Air Quality Standards.~~	Construction Exhaust Emissions: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2A: 2-month Improved Ladder	Fugitive Dust Emissions: Identical to 4-month Improved Ladder Alternative.	Fugitive Dust Emissions: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2A: 2-month Improved Ladder	Construction Exhaust Emissions: Fugitive dust impacts are significant during construction, but after mitigation is applied they are reduced to a level of less than significant. PM_{10}, NO_x, and VOC are significant during construction, but after mitigation is applied they are reduced to a level of less than significant. Operations-related impacts are less than significant.	Construction Exhaust Emissions: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
	~~Total daily emission levels of 963.73 lb/day of CO and 295.96 lb/day Nox would exceed their respective. significance thresholds of 550 lb/day and 219 lb/day set in the National Ambient Air Quality Standards.~~		
2B: 2-month with Existing Ladders	Fugitive Dust Emissions: Identical to 4-month Improved Ladder Alternative.	Fugitive Dust Emissions: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2B: 2-month with Existing Ladders	Construction Exhaust Emissions: Fugitive dust impacts are significant during construction, but after mitigation is applied they are reduced to a level of less than significant. PM_{10}, NO_x, and VOC are significant during construction, but after mitigation is applied they are reduced to a level of less than significant. Operations-related impacts are less than significant. ~~Total daily emission levels of 876.11 lb/day of CO and 269.04 lb/day Nox would exceed their respective significance thresholds of 550 lb/day, and 219 lb/day set in the National Ambient Air Quality Standards.~~	Construction Exhaust Emissions: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
3: Gates-out	Fugitive Dust Emissions: Identical to 4-month Improved Ladder Alternative.	Fugitive Dust Emissions: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
3: Gates-out	Construction Exhaust Emissions: Fugitive dust impacts are significant during construction, but after mitigation is applied they are reduced to a level of less than significant. PM_{10}, NO_x, and VOC are significant during construction, but after mitigation is applied they are reduced to a level of less than significant. Operations-related impacts are less than significant. ~~Total daily emission levels of 1,491.09 lb/day of CO and 457.99 lb/day Nox would exceed their respective significance thresholds of 550 lb/day and 219 lb/day set in the National Ambient Air Quality Standards.~~	Construction Exhaust Emissions: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
		Traffic and Circulation	
1A: 4-month Improved Ladder	Left and Right Banks: Large construction vehicles could exceed the capacity of Sale Lane and Altube Avenue. Neither roadway is designed to accommodate heavy truck traffic, and daily commuting by heavy trucks could impact the road surface.	Left and Right Banks: To reduce construction-related impacts on traffic and roadways, the construction contractor would be required to develop a traffic control plan with the Tehama County Public Works, City of Red Bluff Public Works, and California Department of Transportation, which would be subject to review by California Department of Transportation and the Public Works Director. This plan would ensure that construction traffic is routed in a way that maintains acceptable levels of service on all affected roadways and intersections that are currently measured and used by project-related vehicles. The traffic control plan would address the structural capacity of roads and bridges along routes that could be traveled by construction-related vehicles. The traffic control plan would ensure that the structural integrity of those roads and bridges would not be damaged by construction-related vehicle trips. If damage occurs, road surface would be repaired or replaced on Sale Lane and/or Altube Avenue.	Less than significant
1B: 4-month Bypass	Bypass and Right Bank: Construction-related traffic impacts from construction of the proposed bypass channel are anticipated to be significant on Antelope Boulevard between Sale Lane and Belle Mill Road, although the roadway currently has a measured level of service D in the affected area. In addition, large construction vehicles could exceed the capacity of Sale Lane and Altube Avenue. Neither roadway is designed to accommodate heavy truck traffic, and daily commuting by heavy trucks could impact the road surface.	Bypass and Right Bank: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2A: 2-month Improved Ladder	Left and Right Banks: Large construction vehicles could exceed the capacity of Sale Lane and Altube Avenue. Neither roadway is designed to accommodate heavy truck traffic, and daily commuting by heavy trucks could impact the road surface.	Left and Right Banks: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2B: 2-month with Existing Ladders	Right Bank: Large construction vehicles could exceed the capacity of Altube Avenue. This roadway is not designed to accommodate heavy truck traffic, and daily commuting by heavy trucks could impact the road surface.	Right Bank: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
3: Gates-out	Right Bank: Large construction vehicles could exceed the capacity of Altube Avenue. This roadway is not designed to accommodate heavy truck traffic, and daily commuting by heavy trucks could impact the road surface.	Right Bank: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
Noise — *No significant impacts were identified*			
Environmental Justice — *No significant impacts were identified.*			

Public Draft

Tehama-Colusa Canal Authority Red Bluff Diversion Dam Environmental Impact Statement/Environmental Impact Report

Prepared for

Tehama-Colusa Canal Authority and the U.S. Bureau of Reclamation

August 2002

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1.0 Introduction and Purpose and Need

1.1 Introduction

The Tehama-Colusa Canal Authority (TCCA) Fish Passage Improvement Project at the Red Bluff Diversion Dam (RBDD) Draft Environmental Impact Statement/Environmental Impact Report (DEIS/EIR) addresses the environmental issues, alternatives, and impacts associated with improvement of anadromous fish passage, both upstream and downstream, at RBDD.

This DEIS/EIR was prepared by TCCA and the U.S Bureau of Reclamation (USBR) (see Section 5.1 for agency involvement and a list of the agency approvals required for the project to succeed). This DEIS/EIR meets the legal requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). This document discloses relevant information to all interested parties and invites such parties to play a role in both the decision-making process and the implementation of that decision. This DEIS/EIR also provides federal, state, and local decision makers with detailed information concerning the significant environmental, cultural, and other impacts associated with the alternative courses of action.

Prior to the completion of RBDD, anadromous fish had unimpeded passage through the current dam site. Construction of the dam created a barrier in the Sacramento River, impeding and delaying passage to spawning and rearing habitat above the dam. Constructed in the mid-1960s, the dominant feature of RBDD is its gates. When the gates are lowered into the Sacramento River, the elevation of the water surface behind the dam rises, allowing gravity diversion into the Tehama-Colusa (TC) and Corning canals for delivery to irrigation districts. Raising the gates allows the river to flow virtually unimpeded but precludes gravity diversion into the canals. When the gates are lowered, RBDD presents a barrier for both upstream- and downstream-migrating fish because fish ladders, included in the original dam design, have proven to be inefficient at certain flows to pass anadromous fish to upstream spawning grounds. Additionally, the tailrace and lake created by the dam provide habitat for species that prey on juvenile salmon, reducing their overall survival rates.

Prior to the completion of RBDD, anadromous fish had unimpeded passage through the current dam site.

A Biological Opinion for endangered winter-run Chinook salmon, issued in 1993 by the National Marine Fisheries Service (NMFS), requires that the gates be kept in the raised (non-diverting) position (gates-out) for a greater portion of the year (September 15 to May 14) than had been required previously. This has significantly improved fish passage at RBDD, but has made the facility less effective as a water source for agriculture. The current schedule for gates in the lowered (diverting) position (gates-in) may be subject to further reduction, if it is found to be a reasonable and prudent action, to avoid jeopardy to species recently listed as endangered under the Federal Endangered Species Act (ESA) or the California Endangered Species Act (CESA). Species of concern include winter-, spring-, and fall-/late-fall-run salmon; steelhead; sturgeon; and splittail. However, further reduction of the gates-in period would further reduce RBDD's ability to divert water for agriculture.

1.2 Purpose and Need for the Action

NEPA regulations require that each environmental impact statement (EIS) briefly specify the purpose and need to which the agency is responding in proposing the various alternatives, including the Preferred Alternative. Similarly, CEQA requires that each environmental impact report (EIR) include a statement of the objectives sought by the proposed project. The objectives are intended to help the implementing agency develop a reasonable range of alternatives and aid decision makers in preparing findings or statements of overriding consideration, if necessary. For the purposes of this document, the NEPA-mandated purpose and need statement and the CEQA-mandated project objective are synonymous.

1.2.1 Purpose and Need Statement

The purpose of the project is twofold:

- Substantially improve the long-term ability to reliably pass anadromous fish and other species of concern, both upstream and downstream, past RBDD.
- Substantially improve the long-term ability to reliably and cost-effectively move sufficient water into the TC Canal and Corning Canal systems to meet the needs of the water districts served by TCCA.

The need for this project is in response to the continued well-documented fish passage and agricultural water diversion reliability problems associated with the operation of RBDD.

1.2.2 Similarities and Differences between NEPA and CEQA

By preparing a single document that complies with both NEPA and CEQA statutes, the involved agencies have been able to avoid unnecessary duplication of effort.

This document is designed to comply with both NEPA and CEQA. Both NEPA and CEQA are laws that require governmental agencies to evaluate the environmental impacts of their proposed decisions before making formal commitments to carry them out, and that such evaluation be done in detail, and with public involvement. NEPA is a federal law and applies to federal agencies, whereas CEQA is a California law and applies to state and local agencies. For this project, NEPA requires preparation of an EIS, and CEQA requires preparation of an EIR. By preparing a single document that complies with both statutes, the involved agencies have been able to avoid unnecessary duplication of effort.

Despite the similarities between the two laws, important differences remain. NEPA is a procedural law requiring agencies to evaluate a range of reasonable alternatives, disclose potential impacts, and identify feasible mitigation. Reasonable alternatives must be rigorously and objectively evaluated under NEPA (as opposed to CEQA's requirement that they be discussed in "meaningful detail"). Under NEPA, the evaluation of potential impacts must include socioeconomic impacts, whereas under CEQA, such analysis is not required. Although mitigation is identified in NEPA documents, it is not required to be implemented. In contrast, CEQA requires agencies to implement feasible mitigation measures or feasible alternatives as a means of reducing the severity of significant environmental effects identified in EIRs.

The CEQA requirement to determine a "significance threshold" for expected impacts presents an important or critical feature of the document. Impacts to be covered include those to endangered, threatened, and rare species and their habitat (*CEQA Guidelines*, Section 15065, subd. [a]). Thus, when an EIR shows that a project has the potential to harm a species officially listed under either ESA or CESA, the "lead agency" (TCCA for this project) has a mandatory legal obligation to treat that impact as significant and to mitigate if feasible. Thresholds of significance for other issue areas/resources are developed using applicable regulations where they exist, or best professional judgment.

CEQA requires that this DEIS/EIR propose mitigation measures for each significant effect of the project, subject to the approval of an agency governed by California law, even where the mitigation measure cannot be adopted by the lead agency. For the purposes of this document, it is assumed that TCCA can implement all of the proposed mitigation. However, in the event that implementation of specific mitigation is beyond the jurisdiction of TCCA, it would become the purview of another "responsible agency."

1.2.3 Legislative and Management History

The following information provides a historical view of the overall purpose of RBDD as a part of the Central Valley Project (CVP). Details are chronologically provided describing the legislation impacting these projects.

1937 - Central Valley Project Authorization; August 26, 1937
(Public Law 392; 70th Congress; 50 Stat 844, 850)

This document serves as the original authorization enabling the creation of the CVP. This Act required the Department of the Interior - USBR to submit a detailed feasibility plan for the CVP to the President ~~Truman~~. This Act authorized "…the construction, repair, and preservation of certain public works on rivers and harbors, and for other purposes.'' The CVP was specifically authorized in Section 2 of this document. Section 2 refers to the CVP purpose stating:

> *…to be for the purposes of improving navigation, regulating the flow of the San Joaquin and Sacramento River, controlling floods, providing for the storage and for the delivery of the stored waters thereof, for the reclamation of arid and semiarid lands and lands of Indian Reservations, and other beneficial uses, and for the generation and sale of electric energy as a means of financially aiding and assisting such undertakings and in order to permit the full utilization of the works constructed to accomplish the aforesaid purposes.*

1940 - Central Valley Project Re-authorization; October 17, 1940
(Public Law 868; 76th Congress; 54 Stat 1198, 1199)

This document re-authorized the CVP and reiterated the CVP purpose as stated in the 1937 legislation.

1949 - Central Valley Basin; A Comprehensive Report on the Development of the Water and Related Resources of the Central Valley Basin for Irrigation, Power Production, and Other Beneficial Uses in California, and Comments by the State of California and Federal Agencies; 1949
(Senate Document 113; 81st Congress, 1st Session)

This document identified additional CVP projects needed beyond those already funded and under construction. This includes the early scope of the Red Bluff-Dunnigan Canal. RBDD is not specifically mentioned in this document. However, it appears the Red Bluff-Dunnigan Canal later evolved into the TC Canal including RBDD.

This document alludes to the purpose of the canal by stating, "The Bureau of Reclamation is investigating the economic

possibilities of delivering an irrigation supply to lands in the northern Sacramento Valley lying above the major existing irrigation developments…The Red Bluff-Dunnigan Canal would serve lands along the westerly side of the Sacramento Valley, between Red Bank Creek in Tehama County and the town of Dunnigan in Yolo County.''

Recreation is not specifically identified in the discussions of the Red Bluff-Dunnigan Canal. However, recreation is prominent in the overall "Introduction and Summary'' of all projects included in this document. The "Introduction and Summary'' states:

> *California's future is largely dependent upon the coordinated development of all of the natural resources of the area, to that end the agriculture, industry, mining, lumbering, recreation, and other activities will contribute fully as possible to the prosperity of the region and the Nation. A prime essential of such a program is the orderly development of a system of multiple-purpose reservoirs and related works. These would conserve water for domestic, industrial, and irrigation uses; safeguard urban and rural areas from floods; produce hydroelectric energy; improve navigation; and provide opportunities for recreational activities. Resulting agricultural and industrial expansion would spread large benefits throughout California and add materially to the prosperity and wealth of the Nation.*

To advance the Red Bluff-Dunnigan Canal and other projects noted in this document, USBR was required to submit a feasibility plan, approved by the President, to the Secretary of the Congress. One element of this plan was a study by the National Parks Service to, "…determine the recreational potentialities of the comprehensive plan and to determine what steps should be taken to save, insofar as possible, historical or archeological values which might be lost through the construction of such features…''

The document concluded, "The comprehensive plan described in this report for irrigation, power, flood control, and other purposes in the Central Valley Basin is economically sound.''

1950 - An Act to authorize Sacramento Valley Irrigation Canals, Central Valley Project, California; September 26, 1950
(Public Law 839; 81st Congress, 2nd Session; 64 Stat 1036, 1037)

This document authorizes the Sacramento Valley Irrigation Canals, Central Valley Project. The Sacramento Valley Irrigation Canal's purpose is stated as the same purpose of the 1937 and 1940 CVP authorization:

> *…to be for the purposes of improving navigation, regulating the flow of the San Joaquin and Sacramento River, controlling floods, providing for the storage and for the delivery of the stored waters*

thereof, for the reclamation of arid and semiarid lands and lands of Indian Reservations, and other beneficial uses, and for the generation and sale of electric energy as a means of financially aiding and assisting such undertakings and in order to permit the full utilization of the works constructed to accomplish the aforesaid purposes.

This document specifically authorizes the Tehama-Colusa Conduit irrigation canal and all necessary pumping plants/ works. The Tehama-Colusa Conduit is described as, "…beginning at the Sacramento River near Red Bluff, California and extending southerly through Tehama, Glenn, and Colusa Counties so as to permit the most effective irrigation of the irrigable lands lying in the vicinity of said canal and supply water for industrial, domestic, and other beneficial uses.''

1951 - Report of the Regional Director of the Sacramento Canals Unit, Sacramento River Division Central Valley Project, California; 1951 (House Document 73; 83rd Congress, 1st Session)

This document is the report (feasibility study/plan of development) submitted to, and approved by President Truman on January 19, 1953. This report was required by previous legislation and was submitted to the Secretary of the Congress following the President's approval.

This report proposes the construction feasibility of:

- Corning Canal and Pumping Plant
- Chico Canal and Pumping Plant
- TC Canal and Redbank Diversion Dam (a.k.a. RBDD), distribution, and drainage systems

The "summary sheet'' of this report specifically refers to the purpose and need of the overall project as:

Principally irrigation, with power incidental thereto.

To stabilize agricultural economy, increase supply of dairy and livestock products, protect and expand specialized orchard industry, provide an alternate water supply for inadequate groundwater resources, generate hydroelectric energy for project use, and commercial sales.

Recreation is not specifically identified in the report's purpose and need statement. A brief statement regarding recreation and the construction of the Redbank Dam states, "Redbank Dam will stabilize about 5 miles of the Sacramento River into an elongated lake adjacent to the City of Red Bluff.'' "It is anticipated that the

lake would provide increased opportunities for boating, camping, and fishing.''

As a part of this report, National Parks Service investigated the recreational potential of the Redbank Reservoir. The National Parks Service document begins by stating, "The primary purpose of this reservoir will be diversion for irrigation; a secondary purpose will be for power production.''

The report also details the potential types of recreation that may be developed adjacent to the dam/reservoir:

> *…development of the lake would provide increased opportunities, mainly for picnicking, boating, fishing, and camping, as the lake will probably be too cold for swimming. To utilize these opportunities, roads, trails, parking areas, camping and picnic areas, water supply development, sanitary facilities, landscaping, beaches, boat docks, and additional swimming pool facilities will be needed.*

The ~~report~~ Act was approved by President Truman on January 19, 1953, with the request that it be submitted to Congress for its consideration.

1973 - Endangered Species Act - Congress directs federal agencies to protect and conserve threatened and endangered fish, wildlife, and plant species, and their ecosystems. Sacramento River winter-run Chinook salmon were listed under the Act as an endangered species in 1994, winter steelhead were listed as a threatened species in 1998, spring-run Chinook salmon were listed as a threatened species in 1999, and green sturgeon were listed as a threatened species in 2006.

1984 - California Endangered Species Act - Requires the California Department of Fish and Game (CDFG) to protect and conserve threatened and endangered fish, wildlife, and plant species, and their habitat. Sacramento winter-run Chinook salmon were listed as a state-endangered species in 1989, and spring-run Chinook salmon were listed as a state-threatened species in 1999.

1988 - Salmon, Steelhead Trout and Anadromous Fisheries Program Act - Directs CDFG to implement measures to double the numbers of salmon and steelhead present in the Central Valley.

1993 - Central Valley Action Plan – CDFG adopted as a top priority, "Develop and implement permanent measures to minimize fish passage problems for adult and juvenile anadromous fish at the Red Bluff Diversion Dam in a manner that provides for the use of associated CVP conveyance facilities for delivery of water to the Sacramento Valley National Wildlife Refuge complex."

1992 - Central Valley Project Improvement Act - Requires USBR to "…develop and implement measures to minimize fish passage problems for adult and juvenile anadromous fish at the Red Bluff Diversion Dam in a manner that provides for the use of associated Central Valley Project conveyance facilities for delivery of water to the Sacramento Valley National Wildlife Refuge complex. Costs associated with implementation shall be reimbursed in accordance with the following formula: 37.5 percent shall be reimbursed as main project features, 37.5 percent shall be considered a non-reimbursable Federal expenditure, and 25 percent shall be paid by the State of California."

1996 - Steelhead Restoration and Management Plan for California - Directed the California Department of Fish and Game to implement actions to restore Central Valley steelhead, including determining an alternative to RBDD that would eliminate or reduce the need for the dam gates, and allow unobstructed fish passage.

1997 - Proposed Recovery Plan for the Sacramento River Winter-run Chinook Salmon - The NMFS adopted an objective to maximize the survival of juveniles passing RBDD and recommended developments and implementation of "…a permanent remedy at the Red Bluff Diversion Dam which provides maximum free passage for juvenile (and adult) winter-run Chinook through the Red Bluff area, while minimizing losses of juveniles in water diversion and fish bypass facilities."

2000 - CALFED Bay-Delta Restoration Program Record of Decision - Addressed a vision and program for various CALFED studies and actions. Congress and the State Legislature adopted the ROD as a framework for partnering agencies and stakeholders to implement a comprehensive ecosystem restoration program, which includes "Modifying or eliminating fish passage barriers, including the removal of some dams, construction of fish ladders, and construction of fish screens that use the best available technology."

2000 - CALFED Bay-Delta Ecosystem Restoration Program Plan - Adopted specific conservation measures to "Manage operations at the Red Bluff Diversion Dam to improve fish passage, reduce the level of predation on juvenile fish, and increase fish survival" and to "Prevent predatory fish from congregating below the Red Bluff Diversion Dam by modifying operations."

1.3 Project Setting and Location/Project Facilities

RBDD is located in north-central California on the Sacramento River about 2 miles southeast of the City of Red Bluff (City) (see Figure 1.3-1). The dam and the lake formed by the dam, Lake Red Bluff, are owned and operated by USBR. The lake is about 3 miles long and contains 3,900 acre-feet of water at normal water surface elevation.

RBDD is located in north-central California on the Sacramento River about 2 miles southeast of the City of Red Bluff.

The dam and lake are part of the Sacramento Canals Unit of CVP. The unit was designed to provide irrigation water in the Sacramento Valley, mainly in Tehama, Glenn, and Colusa counties. Also, a part of the unit are the TC and Corning canals, which deliver the irrigation water to areas in those counties.

The dam is a concrete structure 52 feet high and 740 feet long. It consists of 11 gates, each 18 feet high and 60 feet long. The gates are raised and lowered to control the level of Lake Red Bluff and enable diversions to the TC Canal. The headworks of the dam, which is a structure through which water from the lake is diverted into TC Canal, is located on the right abutment of the dam.

The dam gate closest to the right abutment is operated as a sluice gate to remove sediment accumulation near the headworks. The first section of the TC Canal, downstream from the headworks, is enlarged to act as a sediment basin. Sediment deposited in the basin is removed by dredging. The diversion capacity of the first sections of the TC and Corning canals is 3,030 cubic feet per second (cfs). A drum screen structure downstream from the headworks prevents fish passing through the headworks from entering the canals. A bypass system then returns those fish to the river.

In general, the proposed alternatives focus on the operation of RBDD and construction of structures to allow substantial RBDD operational changes.

A fish ladder is located on each abutment of the dam. The steps of the fish ladders drop the water surfaces in the ladders in 1-foot increments as flows pass downstream. Auxiliary flow is added to the ladders near their downstream ends to create a higher flow velocity in the ladders where they enter the river below the dam. This higher velocity is intended to attract upstream migrating fish to the entrance of the fish ladder. The fish ladders have been modified and monitored in the past, and no substantial improvements in fish passage occurred (USBR, 1995).

The direct and indirect impacts of the alternatives occur within the Sacramento River and the San Joaquin River basins.

In general, the proposed alternatives focus on the operation of RBDD and construction of structures to allow substantial RBDD operational changes. When the gates are lowered, RBDD ~~presents a barrier~~impedes passage for both upstream- and downstream-migrating fish because fish ladders, included in the original dam design, have proven to be inefficient at certain flows to pass anadromous fish to upstream spawning grounds. The direct and indirect impacts of the alternatives occur within the Sacramento River and the San Joaquin River basins.

1.4 Proposed Project

Currently, all alternatives are receiving an equal level of consideration. However, the TCCA Board of Directors (TCCA Board) identified the Gates-out Alternative and its Preferred Alternative. The TCCA Board has since clarified its preference to be the maximum pumping facility, regardless of gate operations, recognizing that its chief concern was water supply reliability. This stated preference does not preclude either co-lead agency from selecting a different alternative. USBR has not identified a Preferred Alternative. Following consideration of public comments, the co-lead agencies will jointly identify a specific project to carry forward.

The Public Involvement Program was aimed at educating and including the public in the decision-making process.

1.5 Public Involvement and Scoping

1.5.1 Public Involvement: 1992 to 1994

Following the completion of the Appraisal Study in 1992, USBR commenced the Fish Passage Improvement Program including a detailed Public Involvement Program. The Public Involvement Program was aimed at educating and including the public in the decision-making process. The initial plan identified perceived public involvement needs and actions to meet those needs. This plan was to be implemented over a 6-year period. However, because of a number of concerns, the program was placed on hold in late 1994.

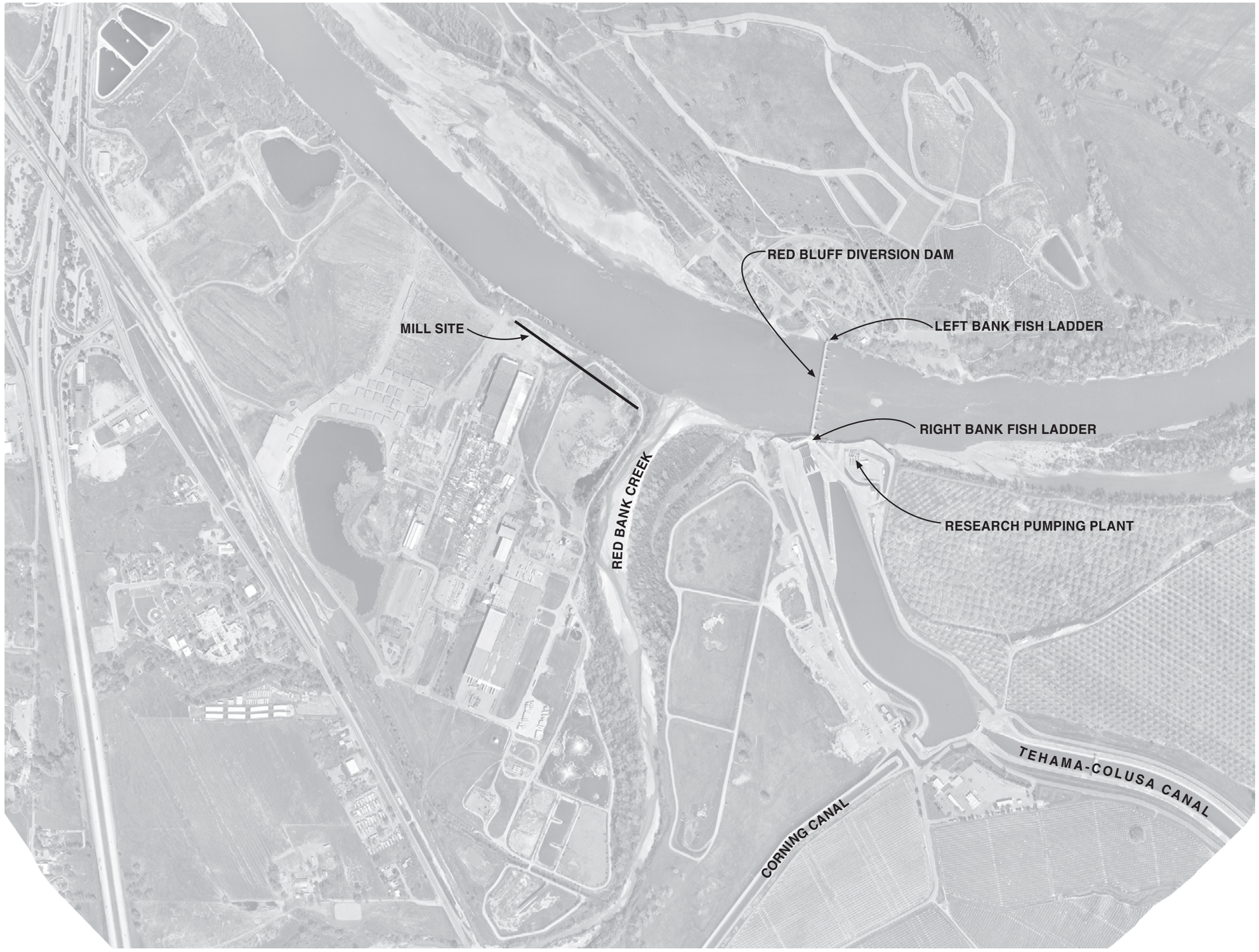

FIGURE 1.3-1
SITE LOCATION MAP
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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The following activities were implemented under the initial plan between 1992 and 1994:

- Conducted a public open house to provide information on the project (September 1992)
- Conducted three public workshops to obtain input and opinions on the program (October 1992)
- Conducted two focus groups including representatives of various interest groups to develop a strategy for the fish passage effort (December 1992)
- Conducted six informal public meetings to educate the public regarding project issues (June to November 1994)
- Formed an Advisory Committee of various interest groups to provide input to the decision makers
- Created a database containing 463 addresses
- Developed a project newsletter
- Created seven fact sheets
- Developed and distributed a Congressional Aide project briefing paper

Scoping is an ongoing process of working with the public and regulatory agencies to identify and refine significant issues.

1.5.2 Public Involvement: 1994 to Present

Since 1994, several interim technical studies have been completed in cooperation with the regulatory/fisheries agencies. These studies examined specific issues at RBDD. In 1999, the NEPA and CEQA environmental processes began. This is a coordinated effort with USBR and TCCA as co-lead sponsors. The project is referred to as the "Fish Passage Improvement Project at the Red Bluff Diversion Dam."

The first step in the environmental process for the Fish Passage Improvement Project at the Red Bluff Diversion Dam was the scoping process. Scoping is an ongoing process of working with the public and regulatory agencies to identify and refine significant issues. The scoping process provides a basis for those important issues to be analyzed throughout the environmental process.

The scoping process began with the publication of the Prescoping Report in January 2000, and formally ended in September 2000, with the publication of the September 2000 Scoping Report. During the scoping period, a public meeting was held on August 8, 2000, to solicit issues, concerns, and ideas from the public and interested agencies.

Approximately 50 individual oral and written comments were received during the scoping period. Twenty-four oral comments were received at the public scoping meeting.

Approximately 50 individual oral and written comments were received during the scoping period. Twenty-four oral comments were received at the public scoping meeting.

A general summary of the main topics of concern noted at the public scoping meeting follows:

- **Bypass Alternative**
  - Why was it eliminated as an alternative?
  - If the bypass alternative is implemented, will whitewater facilities be in the construction plans?
  - Many cost advantages are attached to the bypass alternative.
  - Tehama County will experience economic benefits from the bypass alternative.
- **Impact to Lake Red Bluff**
  - The loss of Lake Red Bluff will have severe economic impacts.
  - Loss of Lake Red Bluff will affect the aesthetics of that area.
  - Termination of Lake Red Bluff will have negative impacts on recreation.
  - Boat races will suffer.
- **Predator Control**
  - High populations of pike minnow are the most serious threats to fish.
  - Seals are also a threat.
  - What about the fish derby?
- **Ladders**
  - Do the existing fish ladders function properly?
- **Electricity/Pumping**
  - Too much pumping will raise electric rates tremendously.
  - Recent electricity alerts have already established electricity as a concern.
  - What will the effect be on agricultural costs?
- **General**
  - The Fish Passage Improvement Project needs more alternatives.
  - What are the issues regarding southern California water concerns?
  - What does "gates-in" entail?
  - Why is the project taking so long to take off?
  - How many salmon have passed through RBDD?

  - Has an off-stream storage site been considered as an alternative?
  - General support for agriculture was witnessed.

- **Support for Gates-out**
  - Fisheries were in support of the longest gates-out periods.
  - Some support for an alternative that would remove the entire dam surfaced.

Public and Agency Concerns Identified during Scoping

Table 1.5-1 provides a summary of public and agency concerns identified during scoping.

TABLE 1.5-1
Summary of Public and Agency Concerns

Agency	Concern
U.S. Forest Service, Mendocino National Forest	Letter, September 17, 2001~~no date~~. Recreational development of the Red Bluff site (Recreation Area) plays a key role in the U.S. Fish and Wildlife Service's (USFWS) plan for a Sacramento River National Wildlife Refuge. The Red Bluff Recreation Area Plan (Plan) emphasizes interpretation of natural systems through displays, facilities, and programs. The bypass channel as presently envisioned (CH2M HILL 2001: 1-G-15) lies entirely within the Red Bluff Recreation Area. The only sizeable portion of the recreation area above the 100-year floodplain, and thus available for facility construction, is located within the area between the proposed bypass channel and the river. If the bypass channel were built according to the present design, the site's existing and proposed interpretive facilities would be cut off from the riparian and upland habitat they are intended to interpret by a 90-foot-wide moat surrounded by an 8-foot-tall fence (CH2M HILL 2001: 90-C-1, 90-C-2). Alternative 1B (Bypass Channel) would not comply with the Land and Resource Management Plan. It would significantly alter the character of the Lake Red Bluff Recreation Area from desired condition set forth in the Plan. Consequently, implementation of Alternative 1B would require a Plan amendment.
U.S. Fish and Wildlife Service	Planning Aid Memorandum dated October 19, 2001. Alternative 1(c) (gates-in 4 months, old ladders, develop water supply from Stony Creek) does not appear to meet the intent of the presently established "Project Need, Purposes, and Goal" (needs and purpose) listed in the CH2M HILL February 2001 document. It appears unlikely to substantially improve the reliability of water deliveries because of the many uncertainties associated with the water supply on Stony Creek. It does not improve fish passage over the No Action Alternative, especially for focus species (spring-run Chinook and green sturgeon). The USFWS listed the alternatives in order of preference: 1. Alternative 3 2. Alternative 2B 3. Alternative 2A 4. Alternative 1A 5. Alternative 1B

TABLE 1.5-1
Summary of Public and Agency Concerns

Agency	Concern
	Main points of discussion: • New ladder designs are not known to produce substantial improvements in fish passage efficiency and reliability over the existing ladders. • Many uncertainties attached to the bypass channel. • Benefits of improved ladders is not as substantial in comparison to reduced gate operations. • Gates-out provides a situation closest to the original ecosystem form and function. • Overall ecosystem benefits will be greater with the gates-out alternative than with the reduced gates alternative.
California Department of Fish and Game	Letter dated October 23, 2001. The ~~California Department of Fish and Game (~~CDFG~~)~~ concurs with the Planning Aid Memorandum prepared by USFWS.
National Marine Fisheries Service	Letter dated October 26, 2001. NMFS fully concurs with the statements and determinations put forth by USFWS.
California Department of Water Resources	Letter dated January 8, 2002. • The alternative that best fits the consideration of improved reliability of both fish passage and water supply at the RBDD is either reduced gates or gates-out. • A reduced gates or gates-out operation would lead to an increase in riparian vegetation in the existing Lake Red Bluff footprint. This vegetation would include both native and invasive introduced species, based on the species present in the Lake Red Bluff area today. From an aesthetic and wildlife standpoint, this increased growth would have both beneficial and detrimental effects. • Approximately 234 acres are within the fluctuation zone of Lake Red Bluff. That would be the area subject to increased growth with a reduced gates or gates-out alternative. The additional vegetation in the floodplain could have significant effects on water surface elevations in the Red Bluff area during high water events. • Additional riparian growth resulting from the project will reduce the flood-carrying capacity of the Sacramento River in already reduced natural floodplains and bypass channels. This potential impact could increase water surface elevations. • A reduced gate operation alternative would mean that only a very small percentage, or even no winter-run salmon, could be directly counted, and run-size estimates would be less accurate. If either the reduced gate or gates-out alternative is selected, additional effort should be made to increase the accuracy of the winter- and spring-run Chinook population estimates above Red Bluff.
Chamber of Commerce	Letter dated January 3, 2002. • The Chamber of Commerce will actively oppose any alternative chosen that eliminates the seasonal impoundment of the Sacramento River behind the gates of RBDD. • To eliminate the opportunity of using the river in its lake-like condition each summer would be a sad and irreparable dis-service to, as well as devaluation of, the economic base of the community.

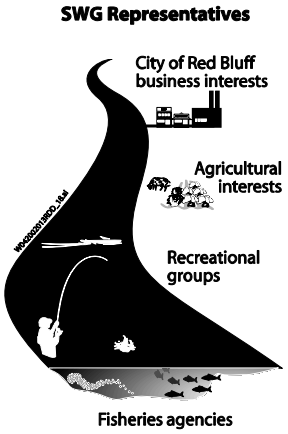
Project Team Structure

TCCA and USBR recognized the need to coordinate with many other organizations, project stakeholders, and government agencies to develop a supported solution meeting the project's purpose and need. To allow for efficient input from these varying interests, the following project team structure was created:

- **TCCA and USBR** - Co-lead agencies sponsoring this project and decision makers, working with the project consultants.
- **Technical Assistance Group (TAG)** - TAG/technical review group meets monthly and includes various public agencies. The group discusses technical issues related to the environmental review.
- **Stakeholder Working Group (SWG)** - Forum for representatives from the agricultural, recreation, business, and general public to raise issues and learn about the project. The group meets monthly and serves as a conduit for information to the larger community. This group originated as a small focus group of interested individuals assisting with preparations for the March 13, 2001 public meeting.
- **Interest Groups, the Public, and Other Public Agencies** - Information channeled through the TAG and SWG members. Provide input through direct communication, letters, project web site, public meetings, and public hearings.

TCCA and USBR created SWG to provide a forum for representatives of various interest groups and organizations to understand and discuss the project issues. This group provides the project team with insight to the views of the public and other special interests. Some of the representatives in the group include:

- The City of Red Bluff
- Fisheries agencies
- Local business interests
- Agricultural interests
- Recreational groups



SWG members also act as liaisons to their respective interest groups regarding the status and issues of the project. Members serve as a direct connection between the project team and the public. Keeping the public involved through SWG, open public forums, and project updates is key to the success of the project. SWG has helped the project identify critical issues regarding the importance of recreation and the aesthetics of Lake Red Bluff and the consideration for power consumption of the proposed pump stations.

The following is a comprehensive list of the public involvement opportunities held for the Fish Passage Improvement Project at the Red

Bluff Diversion Dam following the August 8, 2000 public scoping meeting.

- **Public Meeting:** Red Bluff Community Center, 1500 South Jackson, Red Bluff, CA 96080
  - March 13, 2001
- **Focus Group Meetings:** USBR Office, 22500 Altube Avenue, Red Bluff, CA 96080
  - December 18, 2000
  - January 24, 2001
- **Stakeholder Working Group Meetings:** Red Bluff Community Center, 1500 South Jackson, Red Bluff, CA 96080
  - August 7, 2001
  - October 26, 2001
  - November 13, 2001
  - December 11, 2001
  - January 8, 2002
  - February 12, 2002
  - March 12, 2002
  - April 9, 2002
  - May 14, 2002
- **Project Newsletters:** Three informational newsletters were submitted to the project mailing list (577 addresses) at key milestones (newsletters will coincide with the release of the draft and final environmental documents)
  - September 2000
  - December 2000
  - Summer 2002
- **Project Web Site:** The project web site at **www.tccafishpassage.org** provides detailed and current information on the project.

During the public comment period, a public hearing will be held so that the lead agencies can receive the public's oral and written comments.

Future Actions

This environmental process includes a public comment period, during which the public is asked to supply the lead agencies with comments on this DEIS/EIR. During the public comment period, a public hearing will be held so that the lead agencies can receive the public's oral and written comments.

Once the public comment period closes, the lead agencies will consider and respond to the comments and produce a Final EIS/EIR (FEIS/EIR). No less than 30 days after the availability of the FEIS/EIR, the lead NEPA agencies will produce a Record of Decision (ROD). The lead CEQA agency will certify the Final EIR no less than 10 days after

providing responsible state and other commenting agencies a written response to their comments.

1.6 Required Permits and Approvals

The following approvals are anticipated to be required for each of the proposed alternatives:

- **Federal Clean Water Act Section 404 Permit** – U.S. Army Corps of Engineers (USACE)
- **Federal Rivers and Harbors Act Section 10 Permit** – USACE
- **Federal Endangered Species Act Section 7 Consultation** – USFWS and NMFS
- **Federal Fish and Wildlife Coordination Act Report** – USFWS
- **National Flood Insurance Program Letter of Map Revision** – Federal Emergency Management Agency
- ~~**Easement**~~ **Special Use Permit for Bypass Facility** – U.S. Forest Service (USFS)
- **California Fish and Game Streambed Alteration Agreement** – CDFG
- **California Endangered Species Act Consultation** – CDFG
- **Federal Clean Water Act Section 401 Water Quality Certification** – California Regional Water Quality Control Board (RWQCB)
- **Federal Clean Water Act Section 402 General Construction Activity Stormwater Permit** – California RWQCB
- **Petition to Change Point of Diversion** – State Water Resources Control Board (SWRCB)
- **State Lands Commission Public Agency Lease/Encroachment Permit** – State Lands Commission
- **Encroachment Permit** – State Reclamation Board
- **National Historic Preservation Act Section 106 Authorization** – California Department of Parks and Recreation, Office of Historic Preservation
- **Clean Air Act Permit** – Tehama County Air Pollution Control District
- **Landfill Permitting and Closure Consultation** – California Integrated Waste Management Board ~~(CIWMB)~~

1.7 Preparers of the DEIS/EIR

This DEIS/EIR has been prepared at the direction of the co-lead agencies, TCCA, and USBR. Additionally, this project has actively solicited input and review from cooperating agencies, notably USFWS, NMFS, USFS, CDFG, and DWR. Additionally, throughout the process, input has been considered and solicited from affected parties and agencies, including local governments, trade organizations, interest groups, and individuals. Please see Section 5.2 for a more comprehensive list of individuals involved in the project.

1.8 Areas of Controversy

The following issues associated with the proposed Fish Passage Improvement Project at the Red Bluff Diversion Dam are anticipated to be controversial:

- Reduction in gates-in operations would reduce the amount of time Lake Red Bluff would be available for recreational and aesthetic benefits.
- Operation of a proposed pump station, regardless of the alternative selected, would increase the amount of electricity consumed by CPV (Project Use), thus decreasing the amount of net electricity available for sale to power customers.
- Potential benefits to fish resources accrued under the various alternatives may result in impacts to human-related resources such as recreational opportunities and aesthetics. The balance of benefits to impacts is likely to be controversial.

Other issues, notably project funding, may also be considered controversial; however, these issues are not considered to affect the environment and are therefore not included here.