

UNITED STATES OF AMERICA  
FEDERAL ENERGY REGULATORY COMMISSION

Southern California Edison

Project No. 2086-035  
California

**NOTICE OF AVAILABILITY OF ENVIRONMENTAL ASSESSMENT**

May 4, 2004

In accordance with the National Environmental Policy Act of 1969 and the Federal Energy Regulatory Commission's (Commission) regulations, 18 CFR Part 380 (Order No. 486, 52 F.R. 47897), the Office of Energy Projects has reviewed the application for license for the Vermilion Valley Hydroelectric Project and has prepared an Environmental Assessment (EA) for the project. The project is located on Mono and Warm Creeks, near Shaver Lake, within the county of Fresno, California. The project occupies federal lands within the Sierra National Forest, covering a total of 2,202 acres.

The EA contains the staff's analysis of the potential environmental impacts of the project and concludes that licensing the project, with appropriate environmental protective measures, would not constitute a major federal action that would significantly affect the quality of the human environment.

A copy of the EA is on file with the Commission and is available for public inspection. The EA may also be viewed on the Commission's website at <http://www.ferc.gov> using the "eLibrary" link. Enter the docket number excluding the last three digits in the docket number field to access the document. For assistance, contact FERC Online Support at [FERCOnlineSupport@ferc.gov](mailto:FERCOnlineSupport@ferc.gov) or toll-free at 866-208-3676, or for TTY, (202) 502-8659.

Any comments should be filed within 45 days from the issuance date of this notice, and should be addressed to the Secretary, Federal Energy Regulatory Commission, 888 First Street, N.E., Room 1-A, Washington, D.C. 20426. Please affix "Vermilion Valley Hydroelectric Project No. 2086" to all comments. Comments may be filed electronically via Internet in lieu of paper. The Commission strongly encourages electronic filings. See 18 CFR 385.2001(a)(1)(iii) and the instructions on the Commission's website under the "e-Filing" link. For further information, contact Jim Fargo at (202) 502-6095 or by E-mail at [jamesfargo@ferc.gov](mailto:jamesfargo@ferc.gov).

After reviewing the comments, the Commission will decide whether to revise this EA and will notify the parties accordingly.

Magalie R. Salas  
Secretary

**ENVIRONMENTAL ASSESSMENT  
FOR HYDROPOWER LICENSE**

**Vermilion Valley Hydroelectric Project  
FERC Project No. 2086-035**

**California**

**Federal Energy Regulatory Commission  
Office of Energy Projects  
Division of Hydropower Licensing  
888 First Street, NE  
Washington, DC 20426**

**May 2004**

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## ACRONYMS AND ABBREVIATIONS

Advisory Council	Advisory Council on Historic Preservation
APE	Area of Potential Effect
Basin Plan	Water Quality Control Plan, Upper San Joaquin River Basin
CA-SNV	California-Southern Nevada Power Area
CDFG	California Department of Fish and Game
cfs	cubic feet per second
Commission	Federal Energy Regulatory Commission
CRWQCB	California Regional Water Quality Control Board
HPMP	Historic Properties Management Plan
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission
EA	environmental assessment
FPA	Federal Power Act
FS	U.S. Forest Service
FWS	U.S. Fish and Wildlife Service
kW	kilowatts
kWh	kilowatt-hours
NGVD	National Geodetic Vertical Datum
NGO	non-governmental organization
NEPA	National Environmental Policy Act
NHPA	National Historical Preservation Act
NPS	National Park Service
NRHP	National Register of Historic Places
NTU	nephelometric turbidity unit
O&M	operation and maintenance
PA	Programmatic Agreement
REA	ready for environmental analysis
ROS	recreation opportunity spectrum
SCE	Southern California Edison Company
SHPO	State Historic Preservation Officer
SNTEMP	Stream Network Temperature
SWRCB	State Water Resources Control Board
USGS	U.S. Geological Survey
VQO	visual quality objective
WQC	Water Quality Certification
WSCC	Western Systems Coordinating Council

## **VERMILION VALLEY PROJECT, FERC NO. 2086-CA ENVIRONMENTAL ASSESSMENT**

### **SUMMARY**

On August 30, 2001, Southern California Edison (SCE) filed an application for a new minor license for the Vermilion Valley Hydroelectric Project No. 2086. The existing Vermilion Valley Project is located on Mono Creek in Fresno County, near Shaver Lake, California. The project's original license was issued September 1, 1953, for a 50-year term and expired August 31, 2003. The project has no generating capacity and affects federal lands within the Sierra National Forest, covering a total of 2,202 acres.

SCE operates the Vermilion Valley Project together with six other licensed projects as the Big Creek Hydro system (Project Nos. 2175, 67, 120, 2085, 2017 and 2174, Big Creek Nos. 1 & 2; Big Creek Nos. 2A, 8, and Eastwood; Big Creek No. 3; Mammoth Pool; Big Creek No. 4; and Portal). With a useable storage capacity of 101,700 acre-feet, SCE can use the project's releases to generate power through any of the three series of powerhouses in the Big Creek system.

This Environmental Assessment (EA) evaluates the site-specific and cumulative effects of the continued operation of the Vermilion Valley Project and recommends conditions for a new license for the project. In the EA, we consider three alternatives: (1) SCE's proposal, (2) SCE's proposal with the additional enhancement measures we recommend, and (3) no-action, continued operation of the project as currently licensed.

SCE proposes to:

- Continue releasing an instream flow to Mono and Warm Creeks.
- Consult with the appropriate agencies and, if needed, design and implement erosion control measures in the Warm Creek diversion channel.
- Continue stocking rainbow trout from its own trout-rearing facility in consultation with the California Department of Fish and Game (CDFG) to support recreational fishing in the project area.
- Take more water quality samples in Mono Creek to evaluate potential sources

of increases in iron levels and assess any biological effects of this mineral. If further sampling and analysis determines that the Vermilion Valley Dam represents a point source of iron, SCE will work the Regional Water Quality Review Board to determine if SCE's operations can be altered to reduce the discharge of iron, or if a National Pollutant Discharge Elimination System permit is required.

- Develop a mitigation and monitoring plan and treat the Vermilion Valley dam face in cooperation with the Sierra National Forest (SNF) to control cheat grass, bull thistle, and woolly mullein in this area.
- Develop and implement a recreational enhancement package.
- Develop a Vermilion Valley Project HPMP.
- Remove the improved road between Vermilion Valley Dam and the Mono Creek Campground from the project boundary.
- Consult with the FS on snow clearing activities on Kaiser Pass Road for emergency access to project works.

After evaluating SCE's proposals and the recommendations from resource agencies and interested parties, we considered what, if any, additional environmental measures would be necessary or appropriate for continued operation of the project. The additional or modified measures that we recommend include:

- Provide a variable instream flow to Mono Creek.
- Monitor fish populations for the first few years of the new license term.
- Develop and implement seasonal high flow releases for channel maintenance in lower Mono and Warm Creeks.
- Provide funds for trout stocking in project stream reaches.
- Expand water quality monitoring plan to examine both iron and manganese levels coming from Lake Edison dam leakage.

- Develop and implement a recreation plan.
- Develop and implement a visual resources plan.
- Implement an erosion control plan.
- Develop an eagle management plan.
- Develop an instream flow monitoring plan.
- Develop a transportation system management plan.

Based on this environmental analysis, we conclude that issuing a new license for the Vermilion Valley Project would not be a major federal action significantly affecting the quality of the human environment.

**ENVIRONMENTAL ASSESSMENT  
FEDERAL ENERGY REGULATORY COMMISSION  
OFFICE OF ENERGY PROJECTS  
DIVISION OF ENVIRONMENTAL AND ENGINEERING REVIEW**

**Vermilion Valley Project  
FERC Project No. 2086-CA  
May 2004**

**I. APPLICATION**

The Federal Energy Regulatory Commission (Commission or FERC), under the authority of the Federal Power Act (FPA),<sup>1</sup> may issue licenses or relicenses for up to 50 years for the construction, operation, and maintenance of non-federal hydroelectric projects.

On August 30, 2001, Southern California Edison (SCE) filed an application for a new minor license for the Vermilion Valley Hydroelectric Project No. 2086. The existing Vermilion Valley Project, which has no generating capacity, is located on Mono Creek in Fresno County, near Shaver Lake, California (figure A-1). The project's original license was issued September 1, 1953, for a 50-year term and expired August 31, 2003. The project has operated on an annual license since that time. The project affects federal lands in the Sierra National Forest, covering a total of 2,202 acres.

Under the Commission's regulations, issuing a new license for a project first requires preparation of either an Environmental Assessment (EA) or Environmental Impact Statement, in accordance with the National Environmental Policy Act (NEPA) of 1969.<sup>2</sup> This EA describes and evaluates the potential effects, including an assessment of the site-specific and cumulative effects, if any, of the proposed action and alternatives considered.

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<sup>1</sup> 16 U.S.C. ' 791(a) -825(r).

<sup>2</sup> Pub. L. 91-190. 42 U.S.C. ' 4321-4347, January 1, 1970, as amended by Pub. L. 94-52, July 3, 1975, Pub. L. 94-83, August 9, 1975, and Pub. L. 97-258, ' 4(b), Sept. 13, 1982.

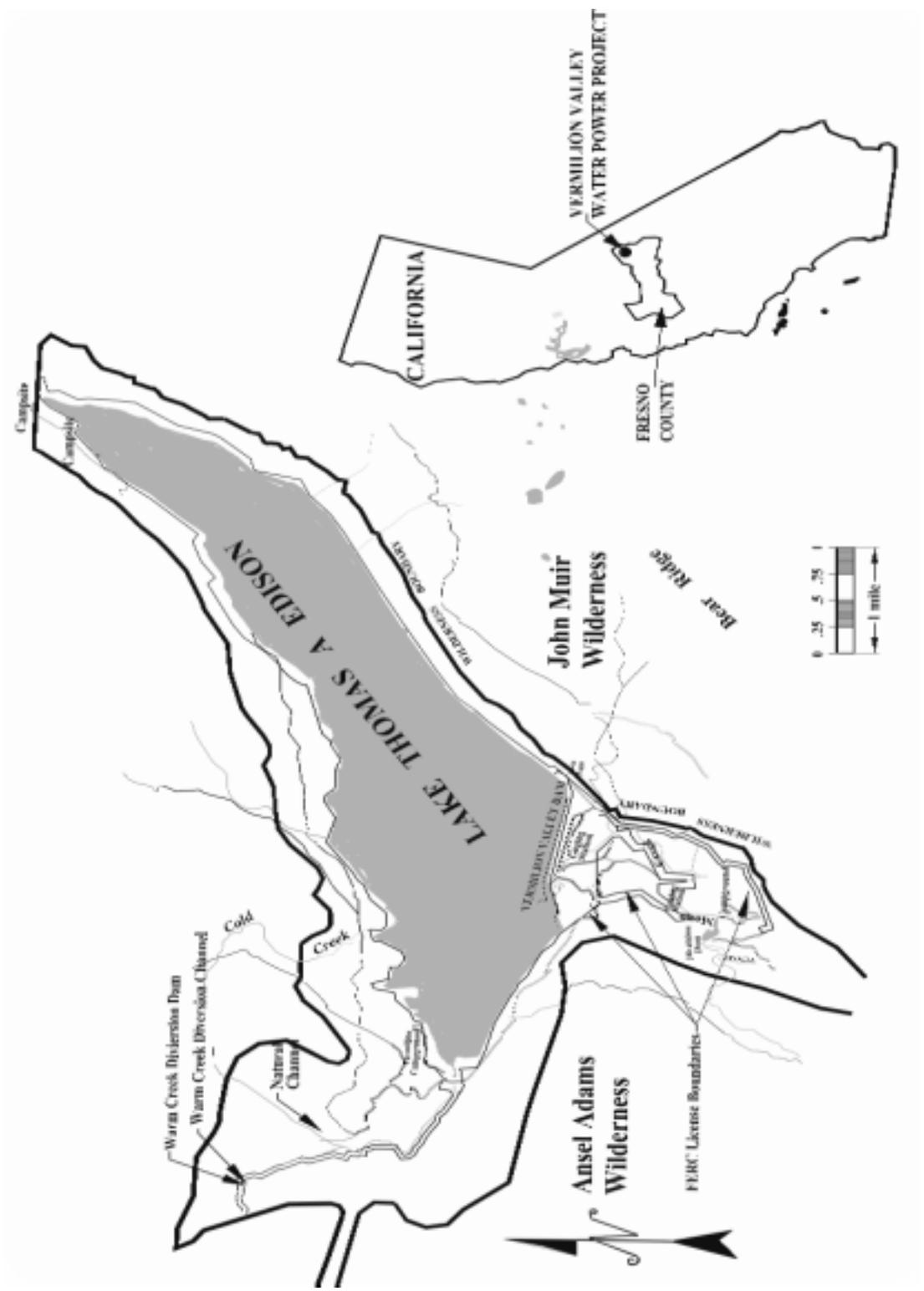


Figure A-1. Vermilion Valley Project Location. (Source: Application, modified by staff)

## **II. PURPOSE AND NEED FOR ACTION**

### **A. Purpose of Action**

The Commission must decide whether to relicense the project and determine what conditions should be placed on any new license issued. In deciding whether to authorize the continued operation of the hydroelectric project and related facilities in compliance with the FPA and other applicable laws, the Commission must determine that the project will be best adapted to a comprehensive plan for improving or developing a waterway. In addition to the power and developmental purposes for which licenses are issued (e.g., flood control, irrigation, and water supply), the Commission must give equal consideration to the purposes of energy conservation; the protection, mitigation of damage to, and enhancement of fish and wildlife (including related spawning grounds and habitat); the protection of recreational opportunities; and the preservation of other aspects of environmental quality.

In this EA, we assess the environmental and economic effects of: (1) operating the project as proposed by SCE (proposed action); (2) operating the project as proposed by SCE with additional enhancement measures (staff alternative); and (3) the no-action alternative (continue project operation under existing license requirements).

The major issues we consider are whether to raise instream flow in Mono Creek, provide flushing flows in both Mono and Warm Creeks, and improve recreational facilities at the project.

### **B. Need for Power**

The Vermilion Valley Project is owned and operated by SCE, a public utility supplying electricity to 4.3 million business and residential customers over a 50,000 square mile service area in coastal, central and southern California. Though the project has no generating facilities, SCE operates the reservoir to provide storage to increase the generation of its Big Creek Hydroelectric system.

To anticipate how the demand for electricity is expected to change in the region, we looked at the regional need for power as reported by the Western Electricity Coordinating Council (WECC) (WECC, 2001). The project is located in the California-Mexico Power (CMP) area of the WECC. The CMP area encompasses most of California and a part of Baja California in Mexico. The CMP area has a significant summer peak demand. For the period from 2002 through 2011, WECC forecasts peak

demand and annual energy requirements in the area to grow at annual compound rates of 2.4 and 1.3 percent, respectively. Severe weather conditions in 1998 and 2000 have affected the area, resulting in numerous curtailments of service to interruptible customers. Even with assumptions about future generation and transmission extension projects, statewide and local reliability problems exist in the short term. Resource capacity margins for the CMP area range between 13.9 and 44.8 percent of firm peak demand for the next 10 years. WECC anticipates that 45,647 megawatts of new capacity will come on line within the next 10 years in the CMP region of the WECC region. We conclude that the region has a need for power over the near term and power from the projects could continue to help meet that need in the future

SCE uses the electricity from project storage to displace the use of gas-fired energy in California's South Coast Air Basin, to lower the incremental system operation and maintenance costs, and to reduce air pollutant emissions. If the project is not relicensed, SCE would need to replace the capacity and output from its operation of Vermilion, most likely through the operation of gas-fired generation facilities. This would increase air pollutant emissions in the basin. If SCE is unable to comply with South Coast Air Quality Management District's emission limits, SCE says that it will be required to compensate by further reducing emissions through boiler modification and installing emissions control equipment.

In summary, if licensed, the power from the project would continue to be useful in meeting SCE's needs as well as meeting a small part of the local and regional need for power. The project helps displace fossil-fueled electric power generation that the region now uses, thereby, conserving non-renewable fossil fuels and reducing the emission of noxious byproducts caused by fossil-fuel combustion.

### **III. PROPOSED ACTIONS AND ALTERNATIVES**

#### **A. Proposed Action and Action Alternatives**

##### **1. Project Description**

The Vermilion Valley Project stores and diverts water from the Mono and Warm Creek watersheds. Project facilities include Vermilion Valley dam, Lake Thomas A. Edison (Lake Edison), the outlet channel to Mono Creek, Warm Creek diversion dam, and the Warm Creek diversion channel (figure A-1). To divert Warm Creek flows into Lake Edison, the Warm Creek diversion dam and channel first diverts water from Warm

Creek to Boggy Meadow Creek, which flows into Lake Edison. The diverted reach of Warm Creek extends about 4 miles from the diversion dam downstream to the confluence with the South Fork San Joaquin River.

As we've said, there are no generating facilities at the project. The primary purpose of the project is water storage. The water SCE stores in Lake Edison is an integral part of its Upper San Joaquin Hydro system. SCE annually stores water in Lake Edison and releases the water to Mono Creek for subsequent diversion through the Big Creek Hydroelectric Project's Mono Creek Diversion (FERC Project No. 67) and on to several powerhouses for electrical generation. Most of the water is stored during the runoff months of April-July when the natural Mono Creek flow is highest. The stored water is then released throughout the rest of the year when the natural Mono Creek flows are low.

## **2. Project Facilities**

The existing Vermilion Valley Project consists of: (1) a 4,234-foot-long earth-fill dam; (2) Lake Edison, with a 125,035 acre-foot (ac-ft) storage capacity at 7,642 feet; (3) a service spillway at the left abutment with a single manually operated radial gate 15 feet wide by 8 feet high, and an auxiliary spillway at the right abutment with an ungated chute discharging into an unlined channel; (4) a man-made leakage channel extending 1,300 feet to Mono Creek; (5) a 3-kW Pelton-wheel turbine located in the outlet structure used to recharge batteries in the valve house; (6) the 4-foot-high Warm creek diversion dam, which diverts Warm Creek flows into Lake Edison via Boggy Meadow Creek; and (7) other appurtenances.

## **3. Applicant's Proposed Operation and Enhancement Measures**

SCE proposes to continue operating the existing project and to maintain the Vermilion Valley Project with no major modifications.

SCE proposes the following operational and enhancement measures to protect and enhance environmental resources that may be affected by the project:

- Consult with the appropriate agencies and, if needed, design and implement erosion control measures in the Warm Creek diversion channel.
- Continue a 0.2 cfs minimum flow release from the Warm Creek Diversion Dam.

- Continue a 10 cfs minimum flow release from the Vermilion Valley Dam to lower Mono Creek.
- Continue stocking rainbow trout from its own trout-rearing facility in consultation with the California Department of Fish and Game to support recreational fishing in the project area.
- Take more water quality samples in Mono Creek to evaluate potential sources of increases in iron levels and assess any biological effects of this mineral. If further sampling and analysis determines that the Vermilion Valley Dam represents a point source of iron, SCE will work with the Regional Water Quality Review Board to determine if SCE's operations can be altered to reduce the discharge of iron, or if a National Pollutant Discharge Elimination System permit is required.
- Develop a mitigation and monitoring plan and treat the Vermilion Valley dam face in cooperation with the SNF to control cheat grass, bull thistle, and woolly mullein in this area.
- Develop a Vermilion Valley Project HPMP.
- Remove the improved road between Vermilion Valley Dam and the Mono Creek Campground from the project boundary.
- Develop and implement a recreational enhancement package
- Consult with the U.S. Forest Service (FS) on snow clearing activities on Kaiser Pass Road for emergency access to project works.

#### **B. Staff's Alternative**

In addition to SCE's proposed measures, we recommend that SCE be required to do the following:

- Provide a variable instream flow to Mono Creek.

- Monitor fish populations for the first few years of the new license term.
- Develop and implement seasonal high flow releases for channel maintenance in lower Mono and Warm Creeks.
- Provide funds for trout stocking in project stream reaches.
- Expand water quality monitoring plan to examine both iron and manganese levels coming from Lake Edison dam leakage.
- Develop and implement a recreation plan.
- Develop and implement a visual resources plan.
- Implement an erosion control plan.
- Develop an eagle management plan.
- Develop and implement an instream flow monitoring plan.

### **C. No-action Alternative**

Under the no-action alternative, the project would continue to operate under the terms and conditions of the existing license, and no new environmental protection, mitigation, or enhancement measures would be implemented. Any ongoing effects of the project would continue. We use this alternative as the baseline environmental condition for comparison with other alternatives.

### **D. Alternatives Considered but Eliminated from Detailed Study**

We also considered other alternatives to SCE's relicensing proposal, but eliminated them from detailed study because they are not reasonable in the circumstances of this case. They are:

- Federal takeover and operation of the project;
- Issuing a nonpower license; and

- Retiring the Vermilion Valley Project.

We do not consider federal takeover and operation of the project to be a reasonable alternative. Federal takeover and operation of the project would require Congressional approval. Although this fact alone does not eliminate this alternative from further analysis, there is no evidence to indicate that federal takeover should be recommended to Congress. No party has suggested that a federal takeover would be appropriate, and no federal agency has expressed an interest in operating the project.

Issuing a nonpower license would not provide a long-term resolution of the issues presented. A nonpower license is a temporary license that the Commission would terminate whenever it determines that another government agency would assume regulatory authority and supervision over the lands and facilities covered by the nonpower license. In this case, no agency has suggested its willingness or ability to do so. No party has sought a nonpower license, and we have no basis for concluding that the project should no longer be used as part of SCE's power system. Thus, in these circumstances, a nonpower license is not a realistic alternative to relicensing.

Project retirement of the Vermilion Valley Project could be accomplished with or without dam removal. Either alternative would involve denial of a license application and surrender or termination of an existing license with appropriate conditions. No participant in this proceeding has suggested that dam removal at the project would be appropriate, and we have no basis for recommending it.

The second retirement alternative would involve retaining the dam and requiring SCE to not operate the reservoir for power purposes. Project works would remain in place and could be used for historic or other purposes. This would require us to identify another government agency with authority to assume regulatory control and supervision of the remaining facilities. No agency has stepped forward, and no participant has advocated this alternative for the project. Nor have we any basis for recommending it. In this circumstance, we do not consider this to be a reasonable alternative.

## IV. CONSULTATION AND COMPLIANCE

### A. Agency Consultation and Interventions

The Commission's regulations require applicants to consult with appropriate state and federal environmental resource agencies and the public before filing a license application. This consultation is the first step in complying with the Fish and Wildlife Coordination Act, the Endangered Species Act (ESA), the National Historic Preservation Act, and other federal statutes. Pre-filing consultation must be complete and documented in accordance with the Commission's regulations.

#### Interventions

On April 25, 2002 the Commission issued a notice that SCE had filed an application to relicense the Vermilion Valley Project and parties could file motions to intervene and protest. This notice set a June 24, 2002 deadline for interventions to be filed. In response to the notice, the following entities filed motions to intervene:

<i>Intervenor</i>	<i>Date of Letter</i>
United States Department of Agriculture	June 6, 2002
United States Department of the Interior	June 21, 2002

#### Ready for Environmental Analysis

Notice that the application is Ready for Environmental Analysis (REA) was issued on April 11, 2002. The following entities commented on or before the June 10, 2002 deadline set by the notice:

<i>Commenting Entities</i>	<i>Date of Letter</i>
State Water Resources Control Board	May 28, 2002
USDA Forest Service, Pacific Region	June 7, 2002
California Department of Fish and Game	June 10, 2002

SCE responded to the comments and conditions by letter dated August 29, 2002.

### Scoping

Before preparing this EA, we conducted scoping to determine what issues and alternatives should be addressed. The scoping document was distributed to interested agencies and other parties on August 6, 2002. The following entities provided written comments:

<i>Commenting Entities</i>	<i>Date of Letter</i>
USDA Forest Service	August 30, 2002
Southern California Edison	September 4, 2002
USDOI National Park Service	September 4, 2002

In response to the scoping notice, the Forest Service provided a channel maintenance and riparian flow analysis. We consider the FS analysis in the aquatic resources section.

The National Park Service suggests we expand our recreation issues to include not only deciding whether existing recreational facilities are safe and adequate to meet existing and projected recreational needs but also to decide whether they protect wildlife resources and provide appropriate Americans with Disabilities Act access.

Since the proposed PM&E measures would benefit the environment, SCE does not see the need for a comprehensive analysis of cumulative effects at this time. SCE says that as more information on the basin is collected as part of its Big Creek Alternative Licensing Process any cumulative effects of the Vermilion Valley Project could more appropriately be considered in greater detail. In this document, we do look at the cumulative effects of continued operation of the project. But we agree with SCE that as

more information is collected in the Big Creek ALP we may need to reexamine the cumulative effects of the Vermilion Valley Project.<sup>3</sup>

Commenting on the aquatic issues, SCE questions the need for channel maintenance flows in Mono and Warm Creek, the need to raise instream flow in the bypass reaches, and the need to set a minimum operating level for the lake. With regards to recreation, SCE says it is obliged to provide facilities to meet the recreation needs related to the project but doesn't think all the recreation in the area is project related. We discuss these issues in the Aquatics and Recreational Resources sections of this document, respectively.

### **B. Compliance with Endangered Species Act**

In section V.C.3, we conclude that continued operation of the project would not likely adversely affect the bald eagle. We will request concurrence on our determination from the U.S. Fish and Wildlife Service.

### **C. Water Quality Certification**

On August 29, 2001, SCE applied to the SWRCB for Water Quality Certification (WQC) for the Vermilion Valley Project, as required by Section 401 of the Clean Water Act. On September 28, 2001, the SWRCB acknowledged its receipt of the request and indicated that as of August 30, 2001, a 1-year time clock started for the SWRCB to take action on the request for certification or waiver.

On August 16, 2002, SCE asked SWRCB to withdraw SCE's application for water quality certification for the Vermilion Valley Project to reset the one year time clock for SWRCB action.

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<sup>3</sup> SCE plans to file their applications for the Big Creek Alternative Licensing Projects starting in November 2005.

By letter dated October 22, 2003, SCE resubmitted its water quality certification application with the SWRCB. The SWRCB is required to take action on SCE's application by October 22, 2004.

#### **D. Section 4(e) Federal Land Management Conditions**

The entire Vermilion Valley Project facilities are located within the Sierra National Forest. Consequently, the FS may issue license conditions that it considers necessary for the adequate protection and use of National Forest System land, pursuant to Section 4(e) of the FPA. The FS filed preliminary terms and conditions for the project on June 7, 2002. On March 9, 2004, the FS filed revised preliminary terms and conditions. The FS said that it would file its final terms and conditions for the project within 60 days of release of the Commission's final EA. The March 9, 2004, filing contains 20 conditions for the Vermilion Valley Project that may be found in Appendix B to this EA.

We summarize the preliminary Section 4(e) conditions as follows:

Conditions 1 through 10 are standard conditions that would require SCE to obtain FS approval on final project design and project changes and consult yearly with the FS to ensure the protection and development of natural resources.

Condition 11 restricts pesticide use. Condition 12 sets flow management requirements, including instream flows and riparian enhancement flows. Condition 13 would protect special status species. Condition 14 sets measures to manage recreation resources, including upgrades to existing facilities. Condition 15 sets measures to protect and maintain roads associated with the license and condition 16 sets measures to protect land resources. The other preliminary 4(e) conditions, 17 through 20, involve vegetation and noxious weed management, cultural resources, coordination with other Big Creek projects, and reserving authority to change the Section 4(e) conditions after the FWS issues a biological opinion for the project.

## V. ENVIRONMENTAL ANALYSIS

The environmental analysis section is divided into a general description of the Upper San Joaquin River Basin, the scope of our cumulative effects analysis, including those resources that are cumulatively affected, and our analysis of the proposed action and other recommended environmental measures. After scoping the issues for the project, we conclude that detailed analyses of geological, terrestrial<sup>4</sup>, socio-economic and land issues are not needed for the Vermilion Valley Project. We analyze geological issues relating to sediment in the Water Quality section.

### A. General Description of the Upper San Joaquin River Basin

The Vermilion Valley Project is located on Mono Creek in Fresno County, near Shaver Lake, California. The watershed draining into Lake Edison consists of high-elevation subalpine and alpine terrain, largely above an elevation of 8,000 feet NGVD and within the John Muir and Ansel Adams Wilderness Areas. Runoff from melting snow governs the natural inflow to the lake, with peak natural inflow typically occurring in May and June.

The Mono Creek drainage basin starts near the northeastern corner of Fresno County at an elevation of about 13,400 feet, covers about 92.5 square miles, and drains in a southwesterly direction. Upstream from Lake Edison, Mono Creek is a free-flowing alpine stream that lies in the John Muir Wilderness area. Downstream from Lake Edison, water flows 1.3 miles to the Mono Creek Diversion Forebay, a part of the SCE Portal Project, FERC No. 67. Streamflow in this reach is the result of flow SCE releases or spills from Vermilion Valley dam.

Project waters include Lake Edison, Mono Creek (upstream and downstream of Lake Edison), Cold Creek, Warm Creek (upstream and downstream of the diversion), Warm Creek diversion channel, and Boggy Meadow Creek, with most of the streams situated in fairly steep channels with moderate to high gradients. Due to precipitous upstream access, the upper reaches of the San Joaquin watershed (above 5,000 feet

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<sup>4</sup> FS preliminary condition 12 F (3) would require SCE to monitor the Mono Creek riparian community every 10 years. Information generated by the monitoring could be useful in determining the need for additional protective measures in the future. If SCE proposes any future riparian protective measures, we will analyze the environmental effects of such measures at that time.

NGVD) were historically devoid of fish. However, through current and past stocking programs, several trout species are now within project waters.

## **B. Scope of Cumulative Effects Analysis**

### **Cumulative Effects**

According to CEQ's regulations for implementing NEPA (15 C.F.R.' 1508.7), a cumulative effect is the effect on the environment that results from adding the effect of an action to other past, present and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

### **Resources That Could Be Cumulatively Affected**

Based on information in the license application, scoping, agency comments, and preliminary staff analysis, we have identified that aquatic resources, recreation resources and cultural resources have the potential to be cumulatively affected by the continued operation of the Vermilion Valley Project in combination with other activities in the basin. We used these three resources to determine the geographic and temporal scope of the EA analysis.

### **Geographic Scope**

Our geographic scope of analysis for cumulatively affected resources is defined by the physical limits or boundaries of: (1) the proposed actions' effect on the resources and (2) contributing effects from other hydropower and non-hydropower activities within the Upper San Joaquin Basin.

The Vermilion Valley Project operates together with the projects from the Big Creek Hydro System. We identified the Upper San Joaquin Basin above Millerton Reservoir as the appropriate geographic area for evaluating cumulative effects because ongoing activities throughout the basin (such as recreational development) could potentially cumulatively affect cultural and fishery resources. As we've said, as more information is collected in the Big Creek ALP we may need to reexamine the cumulative effects of the Vermilion Valley Project.

## **Temporal Scope**

The temporal scope of our cumulative analysis in the EA will include a discussion of past, present, and future actions and their effects on each resource that could be cumulatively affected. Based on the terms of new license, the temporal scope will look 30-50 years into the future, concentrating on the effect on the resources from reasonably foreseeable future actions. The historical discussion will, by necessity, be limited to the amount of available information for each resource. The quality and quantity of information, however, diminishes as we analyze resources further away in time from the present.

## **C. Proposed Action and Action Alternatives**

In this section, we discuss the effects of the proposed action and other recommended alternatives on environmental resources. For each resource area, we first describe the affected environment, which is the existing condition and baseline against which we measure effects. We then describe the applicant's proposed environmental measures and other recommended environmental measures, analyze the specific environmental issues related to these measures, and provide our conclusions about the potential effects. We make our recommendations for measures that should be included in any license issued for the project in section VII, *Comprehensive Development*.

### **1. Water Resources**

#### **a. Affected Environment:**

##### **Water Quantity**

The watershed draining to Lake Edison consists of high-elevation subalpine and alpine terrain, largely above an elevation of 8,000 feet NGVD and within the John Muir and Ansel Adams Wilderness Areas. Runoff from melting snow governs the natural inflow to the lake, with peak natural inflow typically occurring in May and June. According to SCE, the only consumptive water use within the project area is approximately 0.15 ac-ft per year of surface water removed from Lake Edison for use at a nearby FS campground. SCE says that this withdrawal will be replaced by a groundwater well in the near future.

The current year-round instream flow requirement for Mono Creek downstream of Vermilion Valley dam is 10 cfs or natural inflow, whichever is less. The current instream

flow release for Warm Creek, downstream of the diversion dam, is 0.2 cfs during normal and dry years. In addition, the current license requires SCE to release water from a 6-inch pipe near the bottom of the Warm Creek diversion dam for a period of 72 hours on or around May 1 each year.

Three gages are used to measure stream flow and one gage measures lake elevation (reported as storage in acre-ft) in the project area (see figure WR-1 and table WR-1). SCE states that the gage in Warm Creek below the diversion (USGS gage No. 11231700) is typically monitored from mid-April through September or October. In addition, the Warm Creek diversion channel (SCE No. 153) is monitored only when SCE is diverting flow via the Warm Creek diversion dam. USGS gage No. 11231500, Mono Creek below Vermilion Valley Dam, has a period of record both before (1922-1954) and after (1956-2000) project construction.

Table WR-1. Stream and lake gage summary. (Source: SCE, 2001a, and <http://waterdata.usgs.gov/nwis/discharge>)

<i>Gage Number<sup>a</sup></i>	<i>Gage Name and Type</i>	<i>Period of Record (Water Year)</i>	<i>Drainage Area (mi<sup>2</sup>)</i>	<i>Elevation (ft NGVD 1929)</i>
USGS 11231000	Lake Edison (lake storage in acre-ft)	1955-2000	90.0	7,509
USGS 11231500	Mono Creek below Vermilion Valley Dam (stream flow in cfs)	1922-2000	92.5	7,380
USGS 11231700	Warm Creek below the diversion (stream flow in cfs)	1986-1999	2.14	8,030
SCE 153 <sup>b</sup>	Warm Creek diversion channel (stream flow in cfs)	1980-2000		8,025

a SCE owns and operates these gages, and the USGS reviews and publishes the data.

b Data from this SCE gage are not reviewed or published by the USGS.

The average daily inflow to Lake Edison is about 152 cfs or 110,000 ac-ft per year, based on the 1922 to 2000 period of record and adjusted for drainage area differences between the gage and the lake. The elevation of the spillway at Vermilion Valley dam is 7,634.5 NGVD, controlled by a radial gate with a top of gate elevation of 7,642.5 NGVD. The outlet structure has an invert of 7,508.9 NGVD near the bottom of the dam. According to SCE, Lake Edison has a potential storage of 125,035 ac-ft, which is slightly above the average annual inflow volume. Table WR-2 shows the average, minimum, and maximum end of month storage and elevation data for Lake Edison.

Construction of Vermilion Valley dam and project operations have influenced the flow at Mono Creek below Vermilion Valley dam (USGS gage No. 11231500). Figure WR-2 shows daily flow exceedance data for both pre- (1922-1954) and post-project (1956-2000) water years.

Peak pre-project flow as recorded at Mono Creek below Vermilion Valley dam is 1,760 cfs (June 2, 1938). A peak post-project stream flow of 2,160 cfs was recorded on September 26, 1982. Most peak stream flow events at this elevation in the Sierra Nevada mountains are the result of rapid snow melt during late spring or early summer.

Table WR-2. End of month storage and elevation data for Lake Edison. (Source: SCE, 2001a, modified by staff)

<i>Month</i>	<i>Average storage (ac-ft)</i>	<i>Approximate average elevation (ft)</i>	<i>Maximum storage (ac-ft)</i>	<i>Approximate maximum elevation (ft)</i>	<i>Minimum storage (ac-ft)</i>	<i>Approximate minimum elevation (ft)</i>
Jan	47,182	7,597	111,786	7,638	5,579	7,554
Feb	38,616	7,588	96,537	7,628	5,688	7,555
Mar	31,494	7,582	78,531	7,615	4,563	7,552
Apr	33,690	7,584	81,782	7,617	5,005	7,553
May	57,675	7,603	117,147	7,637	5,557	7,554
Jun	87,892	7,622	124,702	7,642	5,734	7,557
Jul	96,688	7,628	125,239	7,643	5,524	7,554
Aug	88,947	7,623	125,035	7,643	8,318	7,558
Sep	80,937	7,618	124,979	7,643	17,639	7,569
Oct	75,487	7,613	124,646	7,642	21,675	7,573
Nov	67,253	7,610	124,757	7,642	6,347	7,554
Dec	57,291	7,602	115,233	7,638	6,009	7,554

SCE manages outflow from Lake Edison to provide flow to the Big Creek system when natural flow is low. Figure WR-3 shows monthly flow exceedance data.

Neither of the two gages in the project area associated with the Warm Creek diversion is operated year-round. Gage No. 11231700, below the diversion, normally does not operate other than from May until September or October, and SCE gage No. 153, Warm Creek diversion channel, only records data during diversion, normally April through August. Table WR-3 shows the average, minimum, and maximum flows for these two gages, but both data sets contain months with incomplete or missing data.

Figure WR-4 shows the yearly flow exceedance graph for USGS gage No.

11231700, Warm Creek below the diversion dam. This gage is typically operated on a seasonal basis from roughly early May until September or October. The maximum daily flow for the period of record of October 1, 1985, to August 8, 1999, is 2.7 cfs. Figures WR-5 and WR-6 show the daily flow values for USGS gage No. 11231700 and SCE gage No. 153.

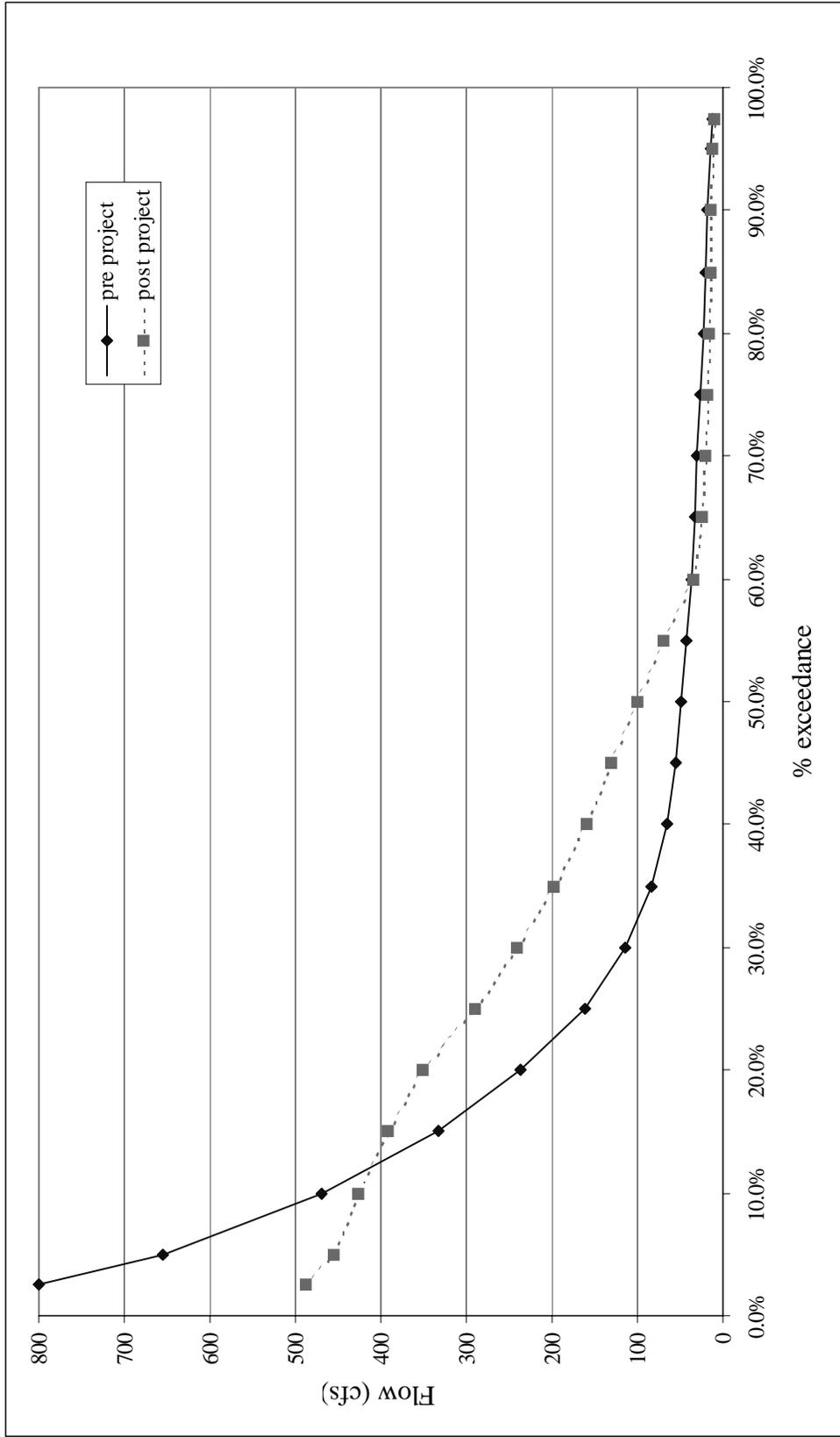


Figure WR-2. Pre- and post-project daily exceedance flow values for Lower Mono Creek as measured at USGS gage No. 11231500. (Source: SCE, 2001a, modified by staff)

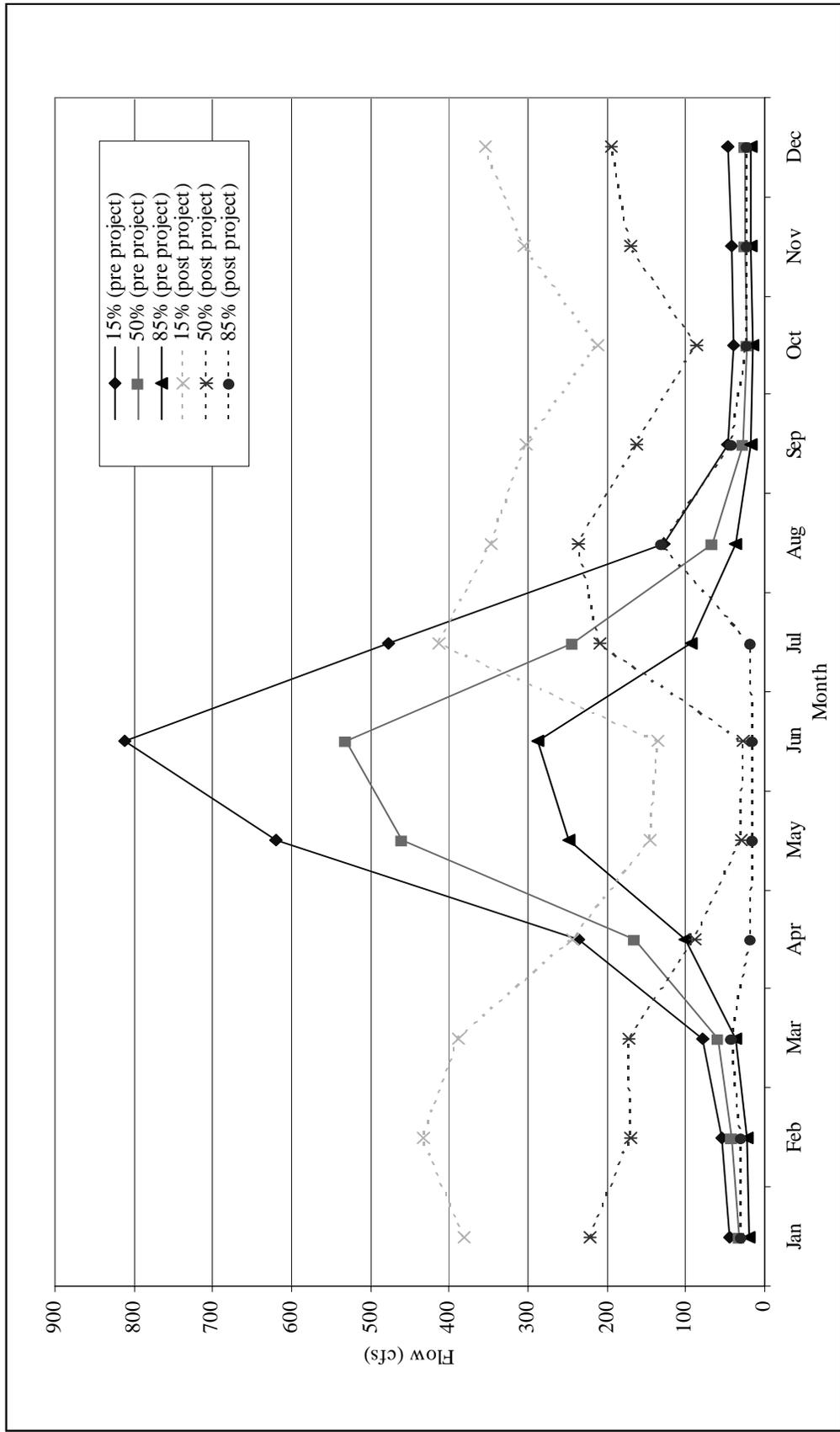


Figure WR-3. Monthly pre- and post-project exceedance flow values for Lower Mono Creek as measured at USGS gage No. 11231500. (Source: SCE, 2001a, modified by staff)

Table WR-3. Monthly flow data (cfs) for USGS gage No. 11231700 and SCE gage No. 153. (Source: SCE, 2001a, modified by staff)

Month	<i>Warm Creek below the diversion (USGS gage No. 11231700)</i>			<i>Warm Creek diversion channel (SCE gage No. 153)</i>		
	Average	Minimum	Maximum	Average	Minimum	Maximum
Oct	0.22	0.13		0.19	0.00	0.86
Nov	0.57	0.16		0.11	0.00	0.08
Dec	-	-	-	-	-	-
Jan	-	-	-	-	-	-
Feb	-	-	-	-	-	-
Mar	-	-	-	-	-	-
Apr	1.04	0.23	2.43	1.64	0.00	4.18
May	0.52	0.09	1.86	7.35	0.00	16.60
Jun	0.48	0.27	0.95	7.53	0.00	40.53
Jul	0.61	0.15	1.68	2.72	0.00	16.91
Aug	0.52	0.09	1.40	0.58	0.00	2.86
Sep	0.26	0.11	0.42	0.41	0.00	3.50

### Water Quality

The Central Valley Region of the California Regional Water Quality Control Board (CRWQCB) sets beneficial use designations for water bodies in the Sacramento and San Joaquin River Basin in its Water Quality Control Plan (WQCP) for these basins. Although the most recent version of this plan (1998) does not directly specify uses for waters in the Mono Creek and Warm Creek watersheds, it does specify beneficial uses for sources to Millerton Lake, which is downstream of the watersheds. These beneficial uses include municipal and domestic supply; irrigation; stock watering; power; recreational uses, including contact recreation, canoeing and kayaking, and other noncontact recreation; warm and cold freshwater habitat; and wildlife habitat. All of these uses are existing beneficial uses.

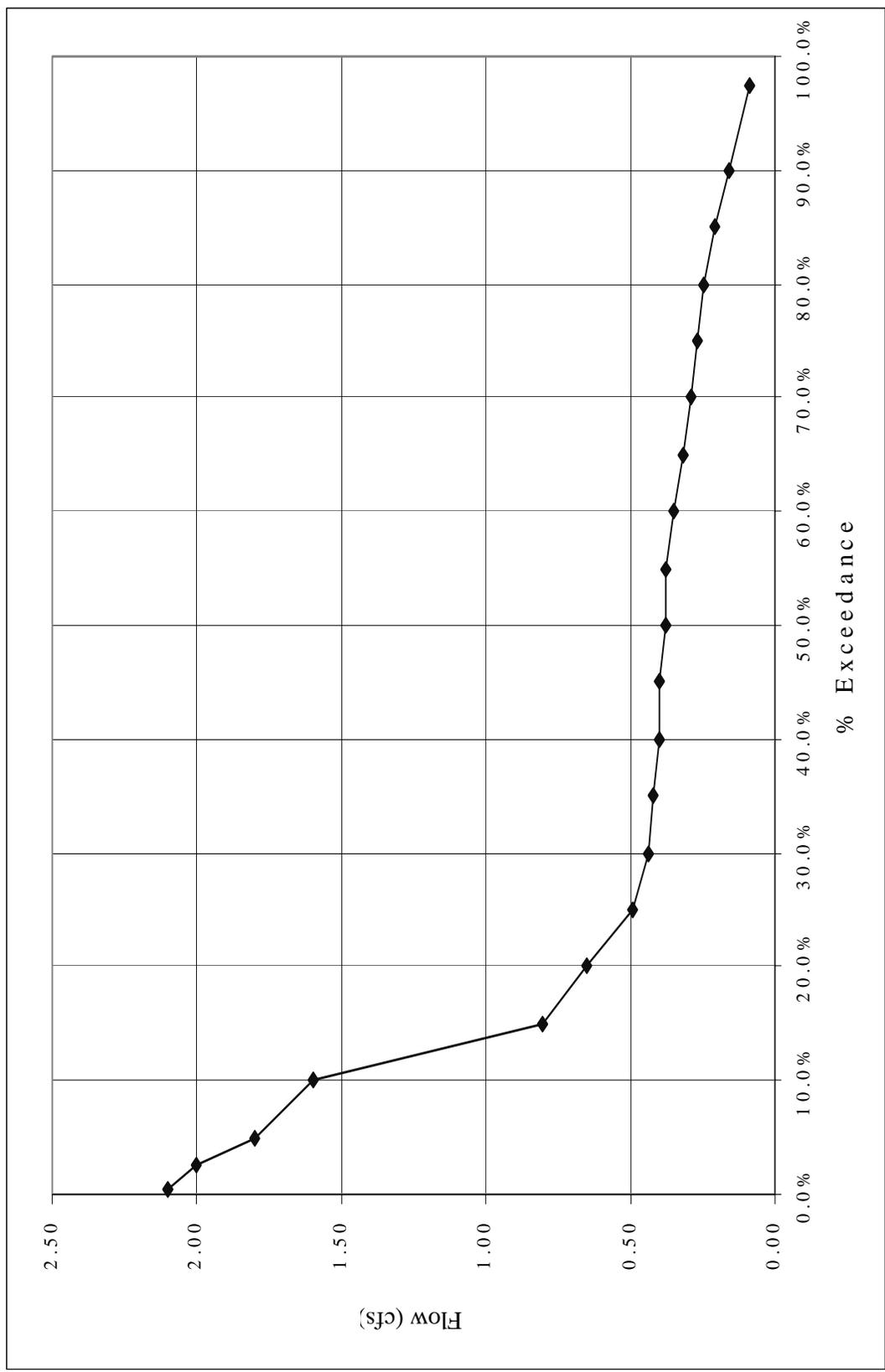


Figure WR-4. Daily exceedance flow values for Lower Warm Creek as measured at USGS gage No. 11231700. (Source: USGS, 2001a, modified by staff)

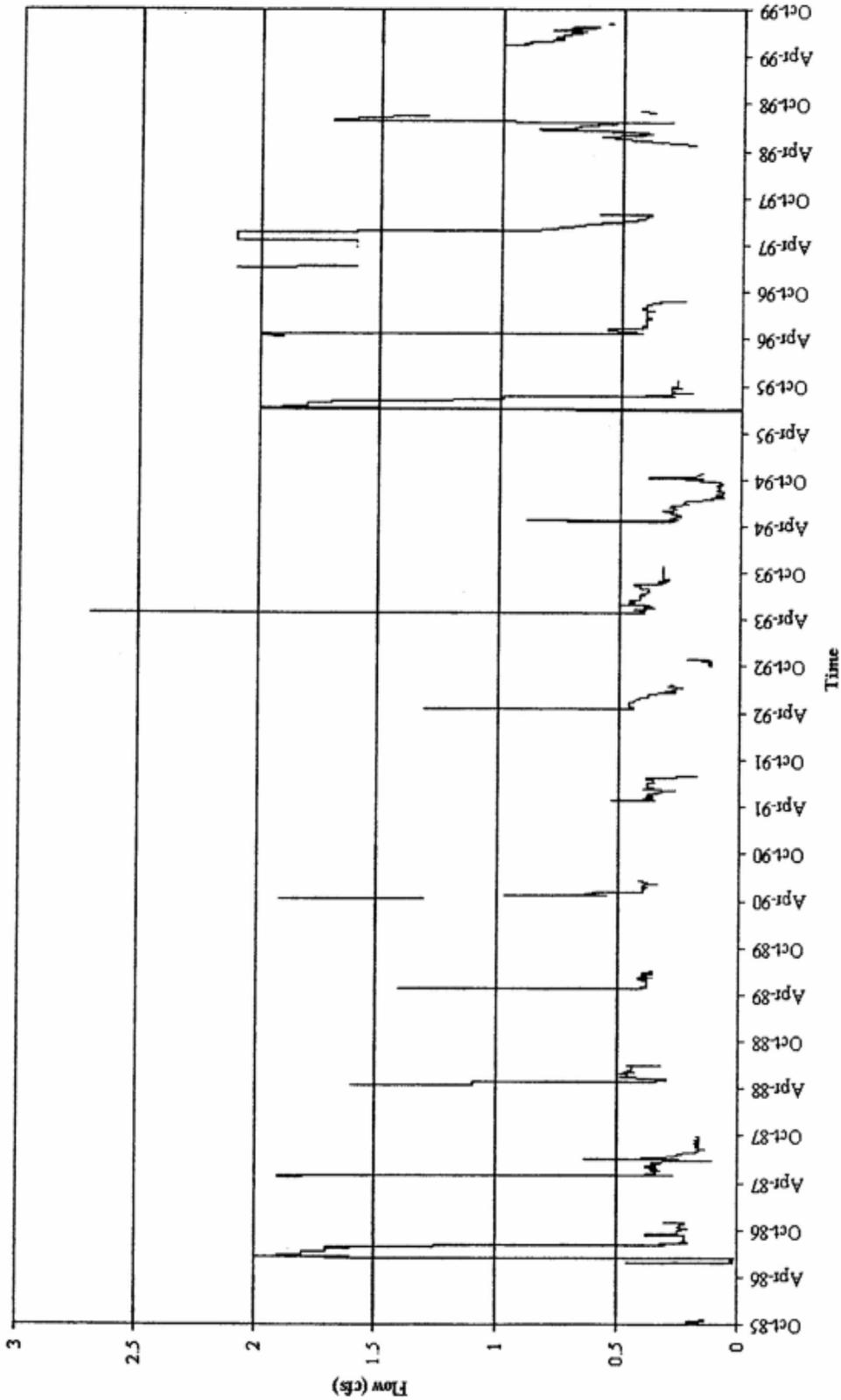


Figure WR-5. Daily flow of Warm Creek downstream of Warm Creek diversion dam. (Source: SCE, 2001a)

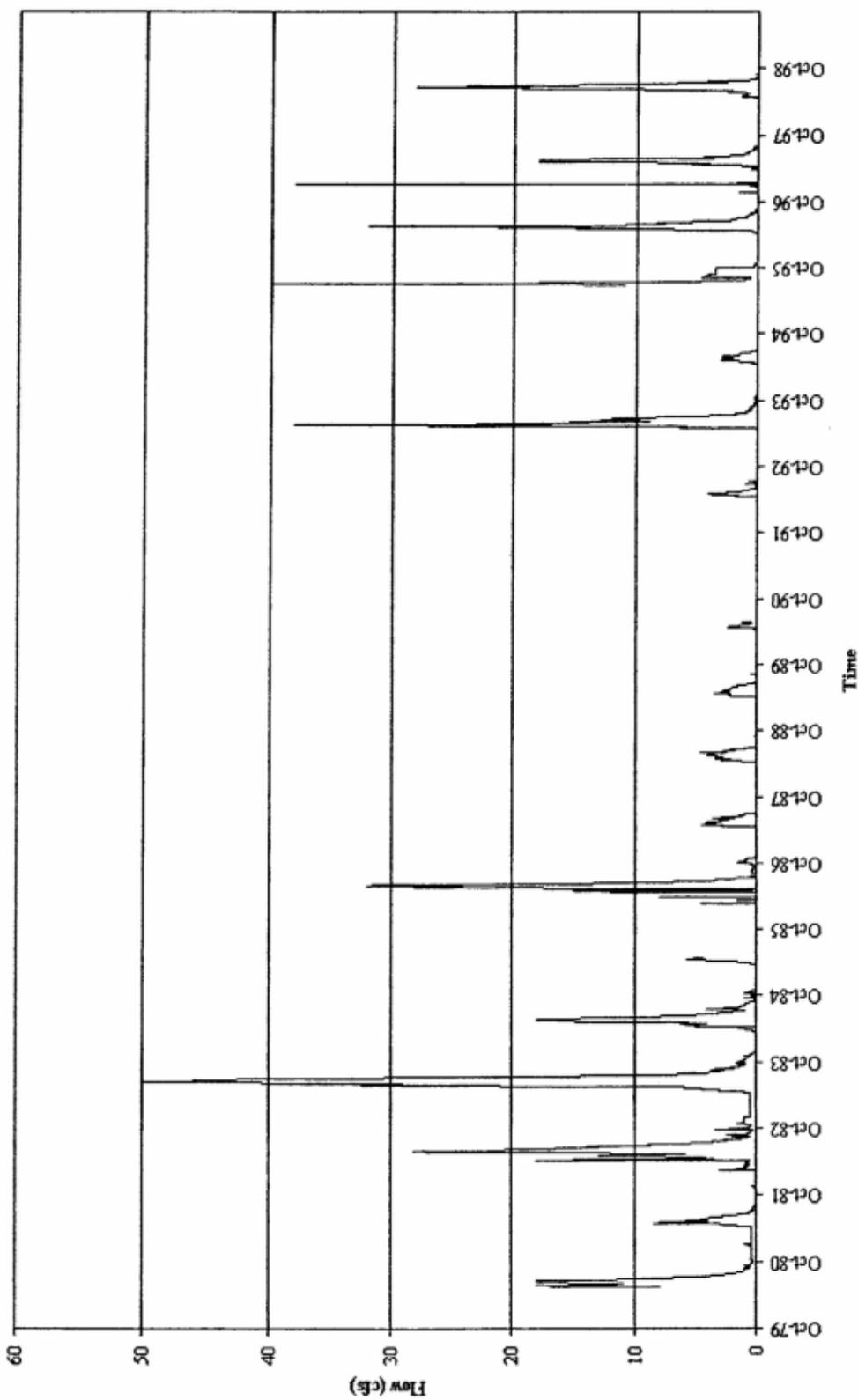


Figure WR-6. Daily flow of Warm Creek diversion channel downstream of Warm Creek diversion dam. (Source: SCE, 2001a)

The WQCP and the CRWQCB's "A Compilation of Water Quality Goals" (CWQG) (2000), designates water quality goals and standards for this basin. Table WR-4 presents a summary of selected standards.

Table WR-4. Water quality standard summary for San Joaquin River Basin. (Source: CRWQCB, 1998; CRWQCB, 2000)

<i>Parameter</i>	<i>Objective/standard</i>
Temperature	Shall not be increased more than 5°F above natural receiving temperature. Natural water temperatures of basin waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration does not affect beneficial uses.
Turbidity	Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits: 0–5 nephelometric turbidity units, (NTUs) not to exceed 1 NTU; 0–50 NTU, increases not to exceed 20%; 50–100 NTU, not to exceed 10 NTU; >100 NTU not to exceed 10%.
Dissolved oxygen	DO concentrations shall not be reduced below the following minimum levels at any time: waters designated WARM, 5.0 milligrams per liter (mg/l); waters designated COLD & SPWN, 7.0 mg/l; monthly median of mean daily saturation, not less than 85%; and early life stage intergravel, 95th percentile saturation not less than 95%.
pH	The pH shall not be depressed below 6.5 or raised above 8.5 nor changed at any time more than 0.5 from the normal ambient levels.
Total dissolved solids	500 mg/l
Settleable solids	Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance, or adversely affects beneficial uses.
Fecal coliform bacteria	This criterion is for protection of bathing waters. Based on a minimum of not less than five samples taken over a 30-day period, the fecal coliform bacterial density shall not exceed a geometric mean of 200 most probable number (MPN)/100 milliliters (ml), nor should more than 10% of the total samples taken during any 30-day period exceed 400 MPN/100 ml.
Iron	0.3 mg/l
Manganese	0.05 mg/l

No historical water quality data for project area water conditions were available. To assess the overall quality of project waters, SCE conducted water quality monitoring surveys in 2000 and 2001 at 13 stations in the project area. Figure WR-1 (see appendix A) identifies the locations of these monitoring stations, and tables WR-5 through WR-8 summarize monitoring results.

Table WR-5. Water quality data from samples collected July 26, 2001, upstream of, within, and downstream of Lake Edison. (Source: SCE, 2001a, as modified by Staff)

<i>Parameter</i>	<i>Upstream of Lake Edison<sup>a</sup></i>	<i>Within Lake Edison<sup>b</sup></i>	<i>Downstream of Lake Edison<sup>c</sup></i>
Temperature (degrees C)	11.5 - 15.6	12.6 - 18.4	10.3 - 10.5
Dissolved Oxygen (mg/L)	7.2 - 7.9	6.8 - 8.2	8.0 - 8.1
Dissolved Oxygen Percent Saturation	72% - 72%	72% - 82%	72% - 72%
Iron (mg/L)	ND <sup>d</sup> - 0.05	ND - ND	0.06 - 0.37 <sup>e</sup>
Manganese (mg/L)	ND - ND	ND - ND	ND - 0.04
Turbidity (NTU)	0.1 - 0.5	0.4 - 0.6	0.8 - 0.8
Total Dissolved Solids (mg/L)	13 - 25	11 - 11	22 <sup>f</sup>
Total Suspended Solids (mg/L)	ND - 5	ND - ND	ND - 6
Specific Conductance (µs)	16 - 20	13 <sup>g</sup>	12 - 13
Fecal Coliform (MPN/100)	2 - 14	< 2 - < 2	< 2 - < 2

<sup>a</sup> "Upstream" water quality stations include WQ-1 (Mono Creek immediately upstream of Lake Edison) and WQ-10 (Cold Creek immediately upstream of Lake Edison.) There was no flow in the Warm Creek diversion channel on July 26, 2001. Values for each station are presented.

<sup>b</sup> "In Reservoir" water quality stations include WQ-2 (Lake Edison at Mono Creek inlet) and WQ-3a and WQ-3b (Lake Edison near Vermilion Valley Dam.) Values presented are the range from lowest to highest value reported.

<sup>c</sup> "Downstream" water quality stations include WQ-4 (Mono Creek 500 feet downstream of Vermilion Valley Dam) and WQ-5 (Mono Creek upstream of Mono Creek Diversion Forebay.)

<sup>d</sup> ND = Not Detected.

<sup>e</sup> One value above 0.30 mg/L; average of all values 0.12 mg/L.

<sup>f</sup> Only one data point supplied by SCE.

<sup>g</sup> SCE presented a value of 5000 mg/L total dissolved solids for the sample taken at station WQ-5 on July 26, 2001. However, a comparison of other parameters for water quality stations WQ-4 and WQ-5 that could reflect that this value is anomalous shows that turbidity (0.8 NTU at stations WQ-4 and WQ-5), total suspended solids (6 mg/L at station WQ-4 versus ND at station WQ-5), and specific conductance (12 µs at station WQ-4 versus 13 µs at station WQ-5) were similar for these stations; therefore, we conclude that this result was anomalous and not reflective of actual total dissolved solids in Mono Creek during the sampling. Total dissolved solids at station WQ-4 was 22 mg/L, which we conclude is reflective of the total dissolved solids level at station WQ-5 during the sampling period.

Table WR-6. Water quality data, upstream and downstream of Warm Creek diversion structure, from samples taken July 26, 2001. (Source: SCE, 2001a, as modified by Staff)

<i>Parameter</i>	<i>Warm Creek upstream of diversion (WQ-6)</i>	<i>Warm Creek downstream of diversion (WQ-8)<sup>a</sup></i>
Temperature (deg. C)	12.8	13.4
Dissolved Oxygen (mg/L)	10.4	9.5
Dissolved Oxygen Percent Saturation	98%	91%
Iron (mg/L)	ND	0.14
Manganese (mg/L)	ND	ND
Turbidity (NTU)	ND	0.4
Total Dissolved Solids (mg/L) <sup>b</sup>	See Footnote b	44
Total Suspended Solids (mg/L)	ND	ND
Specific Conductance ( $\mu$ s)	37	41
Fecal Coliform (MPN/100 ml)	23	4

<sup>a</sup> Water quality station WQ-9 is located several miles downstream and 600 feet in elevation below water quality station WQ-8. Due to the distance and elevation change between stations and the corresponding potential change in water quality parameter values between these stations, data from water quality station WQ-9 was not examined when determining water quality changes due to the Warm Creek diversion location.

<sup>b</sup> SCE presented a value of 540 mg/L total dissolved solids for the sample taken at station WQ-6 on July 26, 2001. However, a comparison of other parameters for water quality stations WQ-6 and WQ-8 that could reflect that this value is anomalous shows that turbidity (ND at station WQ-6 versus 0.4 NTU WQ-8), total suspended solids (ND at stations WQ-6 and WQ-8), and specific conductance (37  $\mu$ s at station WQ-6 versus 41  $\mu$ s at station WQ-8) were similar for these stations; therefore, we conclude that this result was anomalous and not reflective of actual Total Dissolved Solids in Warm Creek upstream of the Warm Creek Diversion Channel during the sampling. If this value is not found to be anomalous, it would not affect our conclusions from this analysis as this value represents conditions not influenced by project operations.

Table WR-7. Water temperature upstream and downstream of Warm Creek diversion, 2001 (Source: SCE, 2001a)

	<i>Warm Creek upstream of diversion</i>			<i>Warm Creek downstream of diversion</i>		
	Mean <sup>a</sup>	Maximum <sup>a</sup>	Minimum <sup>a</sup>	Mean <sup>a</sup>	Maximum <sup>a</sup>	Minimum <sup>a</sup>
June <sup>b</sup>	8.7	12.5	5	8.8	12.7	5
July	9.1	12.9	6.3	9.2	12.9	6.2
August	9.4	13.1	6.1	9.5	13	6.1
September	7.7	10.9	5.3	7.8	10.9	5.3
October	6.6	9.5	3.5	6.6	9.6	3.4

<sup>a</sup> All temperatures in degrees C.

<sup>b</sup> Flow was diverted from Warm Creek to the Warm Creek diversion channel from May 14, 2001 to June 12, 2001.

Table WR-8. Summary of iron and manganese sampling results from water quality sampling upstream, within, and downstream of Lake Edison, 2000 and 2001. (Source: SCE, 2001a, as modified by Staff.)

	<i>Number of Samples</i>	<i>Number of Samples with Iron observed</i>	<i>Range of Observed Iron (mg/L)</i>	<i>Average Observed Iron (mg/L)</i>	<i>Number of Samples with Manganese observed</i>	<i>Range of Observed Manganese (mg/L)</i>	<i>Average Observed Manganese (mg/L)</i>
Upstream of Lake Edison (WQ-1 and WQ-10)	4	1	0.10	0.10	0	N/A	N/A
Within Lake Edison (WQ-2, WQ-3a, and WQ-3b)	6	0	N/A	N/A	0	N/A	N/A
Downstream of Lake Edison, above confluence with dam leakage channel (WQ-4)	4	2	0.06 - 0.06	0.06	0	N/A	N/A
Dam leakage channel (WQ-13)	2	2	4.3 - 4.6	4.5	2	0.40 - 0.42	0.41
Downstream of Lake Edison, below confluence with dam leakage channel (WQ-5)	4	4	0.12 - 0.37	0.21	4	0.01 - 0.04	0.02

SCE also conducted reservoir profiling in both upstream and downstream portions of the reservoir in 2000 and 2001. Figures WR-7 through WR-10 show the results of this monitoring.

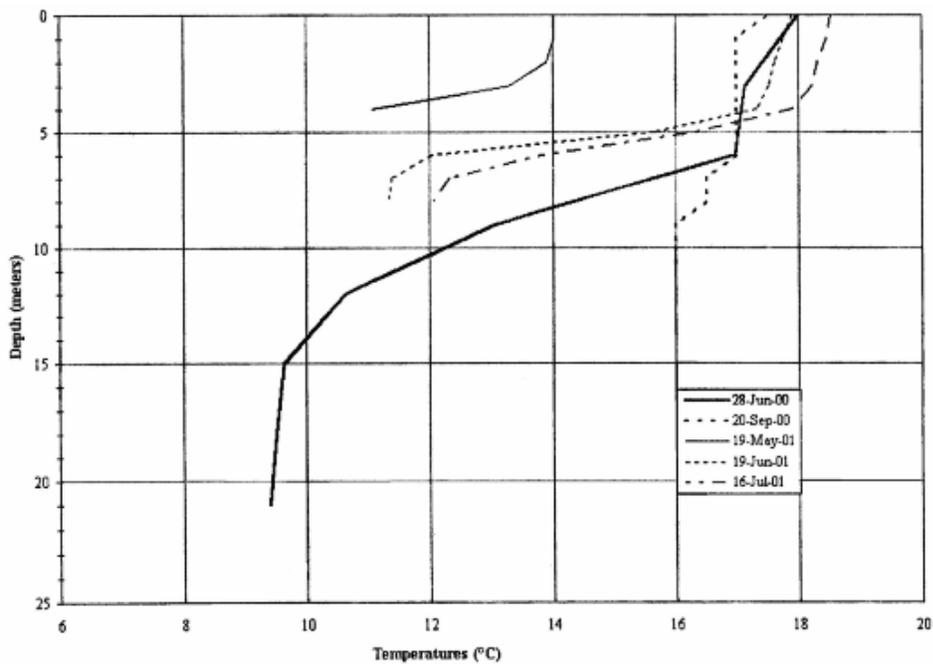


Figure WR-7. Water temperature profile for Lake Edison at the Mono Creek inflow. (Source: SCE, 2001a)

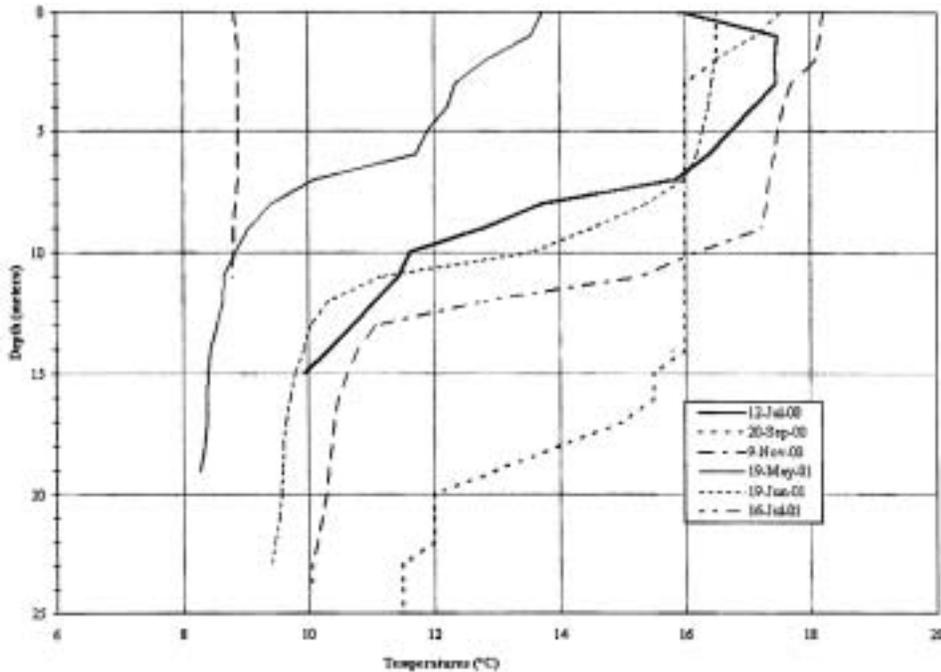


Figure WR-8. Water temperature profile for Lake Edison near Vermilion Valley dam. (Source: SCE, 2001a)

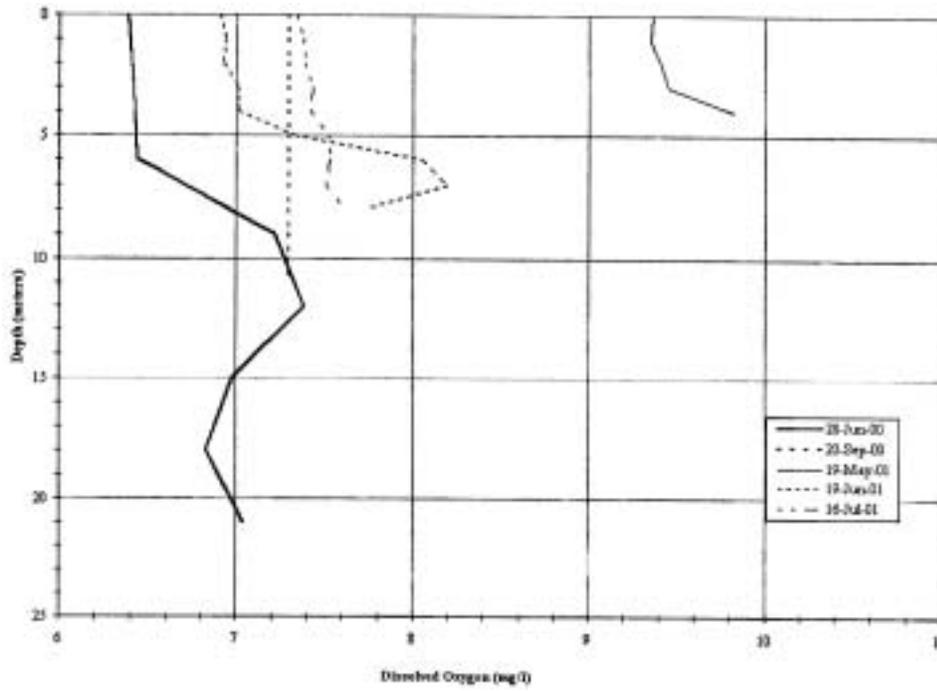


Figure WR-9. Dissolved oxygen profile for Lake Edison at the Mono Creek inflow. (Source: SCE, 2001a)

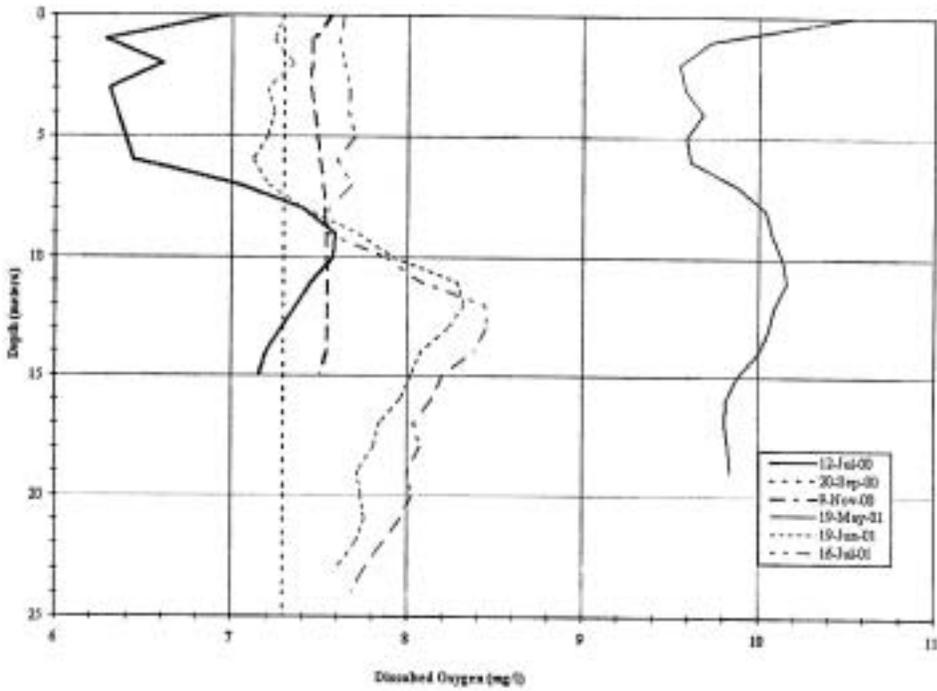


Figure WR-10. Dissolved oxygen profile for Lake Edison near Vermilion Valley dam. (Source: SCE, 2001a)

**b. Environmental Effects:****Water Quantity**

The issues of appropriate minimum flow and channel maintenance flow releases to project-affected reaches (lower Mono Creek and lower Warm Creek) are primarily driven by aquatic and riparian habitat issues and are therefore discussed in section V.C.2, *Aquatic Resources*.

**Flow and Lake Level Measurement**

SCE currently owns and operates four flow or lake level monitoring gages (see table WR-1). In its revised preliminary 4(e) condition 12 B, the FS would require that SCE monitor all instream flow releases in publicly available and accessible formats. SCE and other parties have made no specific recommendations pertaining to flow or lake level monitoring.

*Our Analysis*

Continued operation of the gages at Lake Edison and Mono Creek downstream of Vermilion Valley dam, and reporting of the data from these gages, would ensure that the Commission could document compliance with any flow and storage requirements for Mono Creek and Lake Edison that may be required in any new license that may be issued for this project. U.S. Geological Survey (USGS) supervision over these gages should ensure the collection of reliable data.

We conclude that climatic conditions and very low flows would make year around operation of the gage below the diversion dam on Warm Creek quite challenging and most likely infeasible. Average snowfall at an elevation of 8,000 feet in the Sierra Nevada is in excess of 20 feet per season with common snowpack depths in excess of 8 feet, along with temperatures below freezing for much of the period from November to April. Reliable gage operation in a remote area under these conditions would be questionable.

**Water Quality****Iron and Manganese in the Vermilion Valley Dam Leakage Channel**

SCE proposes to continue water quality sampling in Mono Creek to evaluate

potential sources of increases in iron levels and assess any biological effects of this mineral. If further sampling and analysis determines that the Vermilion Valley Dam represents a point source of iron, SCE will work with the Regional Water Quality Review Board to determine if SCE's operations can be altered to reduce the discharge of iron, or if a National Pollutant Discharge Elimination System (NPDES) permit is required. SCE also proposes to examine the potential for and significance of changes in macroinvertebrate communities within Mono Creek downstream of the dam, and whether it may be related to the water quality in the leakage channel.<sup>5</sup>

SWRCB recommends that SCE conduct additional sampling to determine the concentration of iron and manganese in Mono Creek over a range of flows. Sampling should be carried out at intervals from directly below the leakage channel to the Mono Creek diversion forebay.

The FS has not commented on this matter directly, but makes a preliminary Section 4(e) recommendation that SCE not discharge any waste or byproduct that contains substances in concentrations that would result in a violation of water quality standards set by the state; would impair present or future beneficial uses of water; would cause pollution, nuisance, or contamination; or would unreasonably degrade the quality of any waters in violation of any federal or state law, unless such discharge is authorized by the state.

#### *Our Analysis*

SCE correctly notes that iron and manganese standards are secondary standards established for drinking water taste and odor protection. SCE also notes that a 1986 study into this matter indicated that iron accumulations, which were not in violation of federal or state water quality standards at that time, were not causing any direct iron toxicity effect on fisheries downstream of the dam. However, SCE notes that there was a reduction in the biomass and species diversity of benthic invertebrates in the leakage channel, and that this could be caused by the observed iron concentration.

The state standards for iron and manganese in the San Joaquin River basin are 0.3 mg/l and 0.05, respectively (see table WR-4). Water quality data (table WR-8) shows that

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<sup>5</sup> The leakage channel is the collection point for water that seeps under the dam. It consists of a constructed channel extending from the toe of the dam to Mono Creek. Three pipes that collect leakage from under the dam discharge to this channel.

the levels of iron and manganese flowing into, maintained within, and flowing immediately downstream of Lake Edison above the confluence of the leakage channel are within state standards. Observed manganese levels below the confluence of the leakage channel were within state standards, but one observed iron level exceeded state water quality standards. Observed iron and manganese levels in the leakage channel exceeded state water quality standards by about an order of magnitude.

Iron and manganese could be originating from the dam itself, a sedimentary deposit near the dam face, or another natural source near the dam. In many lakes, iron and manganese concentrations are elevated under the reduced conditions characteristic of an anoxic hypolimnion (Wetzel, 2001). Because the Lake Edison hypolimnion does not become anoxic, however, leakage of hypolimnetic water should not be the source of elevated iron and manganese concentrations in this instance. Before a potential resolution to this issue can be developed, more information is needed to determine the source of iron and manganese and document the effect of dam outflows and leakage flows on iron and manganese concentrations.

#### Erosion Control Measures at the Warm Creek Diversion Channel

SCE proposes to consult with the appropriate agencies and, if needed, design and implement erosion control measures in the Warm Creek diversion channel.

SWRCB recommends that turbidity above and below the Warm Creek diversion during diversion operations be assessed to determine if project operations result in increased turbidity that violates state water quality criteria.

FS's preliminary condition 12 F would require SCE to monitor sediment in Warm Creek every ten years in consultation with the FS and other appropriate resource agencies and provide a report to the FS and the consulted agencies that summarizes the findings. Condition 12 F would also require SCE to develop an erosion control plan. Included in the plan would be sections that identify both project-related sediment sources and any measures SCE recommends to reduce sediment delivery to the Warm Creek Diversion Channel and Boggy Meadow Creek.

#### *Our Analysis*

SCE evaluated the condition of the streambed and banks along the Warm Creek Diversion Channel during 2000 and 2001. They found evidence of erosion within the constructed channel, primarily channel bed and toe-of-slope driven bank failures. They

found that about 100 feet of the channel downstream of the weir has erodible banks that are not adequately stabilized with either vegetation or adequately sized/stabilized boulder bed elements. SCE concludes that erosion along this channel will continue and may produce relatively high volumes of sediment. We agree with SCE's assessment of the potential for continued erosion along portions of this channel.

c. Unavoidable Adverse Effects: None

d. Cumulative Effects on Water Quantity:

Project effects on water quantity are predominantly tied to the influence of flows on aquatic habitat. We therefore discuss proposals and recommendations that pertain to water quantity in section V.C.2.b, *Aquatic Resources*, and discuss the cumulative effects of alternative flow regimes on fisheries resources and water quantity in section V.C.2.d.

## **2. Aquatic Resources**

a. Affected Environment:

The project area is located above 7,000 feet NGVD in the San Joaquin River watershed of the Sierra Mountains. Project waters include Lake Edison, Mono Creek (upstream and downstream of Lake Edison), Cold Creek, Warm Creek (upstream and downstream of the diversion), Warm Creek diversion channel, and Boggy Meadow Creek, with most of the streams situated in fairly steep channels with moderate to high gradients. Stream substrates are varied and range from pools with small sized substrate to runs and high-gradient riffles with cobbles and boulders. Due to precipitous upstream access, the upper reaches of the San Joaquin watershed (above 5,000 feet NGVD) were historically devoid of fish. However, through current and past stocking programs, brown trout, rainbow trout, brook trout, and a rainbow-golden trout hybrid<sup>6</sup> are now within project waters.

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<sup>6</sup> The origin of the rainbow-golden trout hybrid is unknown, but the close relationship between the rainbow and golden trout allows them to crossbreed. Although golden trout are not native to the area, they have been the object of considerable stocking efforts throughout high elevation areas within the Sierras, so at some time they were undoubtedly stocked in this area.

According to SCE's 2000 fishery studies, brown trout is the most abundant species within project waters, and was found, along with rainbow trout, in all project waters except Warm Creek (table AR-1). Brook trout were found in Boggy Meadow Creek, Cold Creek, and Upper Mono Creek (upstream of Lake Edison) during the 2000 fishery study. The rainbow-golden trout hybrid was only found in Warm and Cold creeks.

Table AR-1. Fish collected in project area waters (Source: SCE, 2001a, modified by staff).

<i>Stream</i>	<i>Rainbow Trout</i>	<i>Brown Trout</i>	<i>Brook Trout</i>	<i>Rainbow-Golden Trout Hybrids</i>	<i>Total</i>
Boggy Meadow Creek	14	67	53	0	134
Cold Creek	7	58	1	1	67
Lower Mono Creek	20 <sup>a</sup>	127	0	0	147
Upper Mono Creek	59	374	40	0	473
Lower Warm Creek	0	0	0	33	33
Upper Warm Creek	0	0	0	40	40
Lake Edison	6	39	0	0	45
Near Cold Creek					
Near Mono Creek	22	19	0	0	41
Lake Edison <sup>b</sup>	9	449	0	0	53
Near Mono Creek					

<sup>a</sup> Includes fish of hatchery origin.

<sup>b</sup> Data collected in 2001.

The general life history and habitat requirements of the trout species are similar (Smith, 1985).<sup>7</sup> They are found throughout their life cycle in perennial rivers or streams with moderate- to fast-moving waters and gravel to rocky substrates. They also occur in lakes, but except for the brook trout, which is capable of spawning in lakes if suitable habitat exists, they must have access to streams in order to reproduce. All three species prefer coldwater temperatures, with preferred upper range limits of 14.6°C, 16.0°C, and 21.3°C for rainbow trout, brook trout, and brown trout, respectively (table AR-2). Juvenile brown trout feed on benthic organisms, while adults eat fish (they are piscivorous - preying upon young of their own or of other trout species), tadpoles, and larger items. Brook trout feed upon a wide variety of aquatic insects and other invertebrates as well as

<sup>7</sup> For this analysis, we assume that the life history and habitat requirements for the rainbow-golden trout hybrid are similar to that of the rainbow trout.

fish and terrestrial insects that fall into the water. Rainbow trout are primarily surface feeders feeding on aquatic and terrestrial insects; however, they will feed on plankton, larger invertebrates, and small fish as well.

Table AR-2. Preferred and upper lethal temperatures for rainbow trout, brook trout, and brown trout. (Source: Bjornn and Reiser, 1991)

<i>Species</i>	<i>Preferred Temperature Range (°C)</i>	<i>Upper Lethal Temperature (°C)</i>
Rainbow trout	7.3 to 14.6	24.1
Brook trout	14.0 to 16.0	25.8
Brown trout	3.9 to 21.3	26.7

All three species of trout generally reach reproductive maturity during their second or third year of life and spawn in gravel riffles in streams with sufficient current to aerate the eggs and prevent silting over the gravel in which the eggs are buried (Smith, 1985). Brown and brook trout generally spawn in the fall or early winter. In the project area, they begin their spawning migration in September with peak spawning occurring in October and November. Brown trout eggs hatch in 11 to 16 weeks, depending on temperature, and fry emerge from the gravel several weeks later. Rainbow trout generally spawn in spring and, within the project area, spawn from April through June. Rainbow trout eggs hatch in 11 to 15 weeks, depending on temperature, and fry emerge from the gravel two or three weeks after hatching. After emerging from the gravel, trout fry inhabit quiet water close to banks among large rocks or overhanging vegetation<sup>8</sup>, and as they mature may migrate into Lake Edison or other downstream areas or remain in the stream and defend a small home range.

The fishery objective of the CDFG for the project waters is to maintain or enhance recreational angling opportunities of trout (most importantly brown and rainbow trout). In recent years, the CDFG has managed Lake Edison as a “put and grow” fishery by planting fingerling sized rainbow trout, while it has managed the fishery in lower Mono Creek (below the Vermilion Valley dam) as a “put and take” fishery by stocking only catchable-size rainbow trout. SCE maintains a trout rearing facility and a voluntary stocking program. SCE has previously stocked catchable rainbow trout in Lake Edison in 1969 and in lower Mono Creek in 1962, 1963, 1966, and 1969.

The current FS management objectives for the project waters are: (1) for Lake

<sup>8</sup> For brown trout in the project area, this is typically from June through October.

Edison and Mono Creek--between Vermilion dam and Mono Creek forebay-- manage the waters as a "put and take" fishery for rainbow trout and brown trout, provide for large fish, define a harvestable component (lbs/acre), and define an angler catch rate (fish caught/hr); (2) for Mono Creek upstream of Lake Edison--manage as a self-sustaining fishery for rainbow and brown trout and maintain or improve spawning habitat for fish within the lake; (3) for Warm, Cold, and Boggy Meadow creeks--manage for self-sustaining resident trout without negative impacts on any amphibians listed as sensitive by U.S. Forest Service Region 5 or federally listed as threatened, endangered, or proposed by the FWS.

### **Lake Edison**

Two species of fish were caught during gill net and trap net surveys conducted by SCE and CDFG in 2000 and 2001. Survey sites during 2000 were near Cold Creek and Mono Creek, and sampling was conducted in October (when any brown or brook trout in Lake Edison would be moving into tributaries to spawn). During 2001, a single survey site was sampled in June near Mono Creek. A total of 86 fish was caught during 2000 with brown trout and rainbow trout comprising 67.4 and 32.6 percent of the catch respectively. During 2001, 53 fish were caught with brown and rainbow trout comprising 83 and 17 percent of the catch respectively. Twice as many brown trout were caught near the mouth of Mono Creek during the 2001 survey than in 2000 (44 vs. 19 fish). SCE attributes this to possibly the timing of the 2000 survey, which was conducted during the fall when brown trout were observed spawning upstream in the tributaries. Most fish caught were between 300 and 400 mm in length in both 2000 and 2001, with a few fish between 150 and 250 mm in length.

SCE did a hydroacoustic survey during 2000 from the dam to the mouth of Mono Creek to evaluate the vertical distribution of fish within the lake. A more intensive survey was done in the vicinity of the intake area during 2001. Fish were distributed throughout a wide range of water depths, and most were found associated with the substrate, except in the deepest depths surveyed. In those areas the fish tended to occur somewhat higher in the water column off of the substrate. During the 2001 survey, few fish were found in the vicinity of the dam (13 fish total) with only one fish at a depth near the intake structure.

Lake Edison provides good spatial habitat for the resident trout species as it contains both deep and shallow water habitats. These habitats vary in their area and proportions with the storage (in spring and early summer) and drawdown (fall and winter) patterns of the reservoir. At full pond level, the reservoir has a storage capacity of about

125,035 acre-feet and a maximum depth of about 161.5 feet in the vicinity of the spillway gates. During drawdown, we estimate that the minimum depth of the reservoir in the vicinity of the spillway gates is about 70 feet. During the course of the year, the surface waters of the lake warm, forming a thermocline as early as May, which strengthens throughout the summer. In the fall, as air temperatures decrease, surface water temperatures begin to decrease as well and the lake becomes completely mixed. During 2001, lake water temperatures generally remained below 18°C and were always within the preferred temperature range of the brown trout with a maximum temperature of 19.4°C in the surface waters in August. Although these surface temperatures exceeded the preferred temperature range of the rainbow trout, they did not approach the lethal limit, and temperatures were below 15°C at depths of about 19 feet at the mouth of Mono Creek as it enters the lake, and about 30 to 46 feet at Vermilion Valley dam (SCE, 2001b).

CDFG has stocked Lake Edison annually with trout for a number of years (dating back to at least 1955).<sup>9</sup> In recent years CDFG's has managed the lake as a "put and grow" fishery, stocking a total of 364,902 fingerling rainbow trout from 1994 to 2000 (between 20,246 and 95,250 trout per year). Although no harvest information is available, information gathered from a limited creel survey conducted in 2000 suggests that the recreational trout fishery in Lake Edison and the surrounding waters is highly valued.

### **Warm Creek**

Warm Creek is characterized by having a moderate to steep gradient and a low flow base. During most of the year the base flow is about 0.2 cfs. As we've said, during the spring run-off period, flows can reach as much as 40 cfs. During this time, flows are diverted into Lake Edison via the Warm Creek diversion channel and Boggy Meadow Creek. When flows subside, water diversion is stopped before reaching the minimum flow requirement of 0.2 cfs. On or about May 1 of each year, SCE is required to release flushing flows below the diversion through a 6-inch pipe for a period of 72 hours.

Upstream of the diversion, the creek bed consists mainly of boulder and cobble substrates creating riffle, run, and pool habitats. Below the diversion, substrates are predominantly bedrock and boulder, which create varying degrees of cascade, run, riffle, and pool habitats. Near the confluence of Warm Creek and the South Fork San Joaquin

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<sup>9</sup> In the past, CDFG has stocked Lake Edison with brook trout and brown trout in addition to rainbow trout. However, rainbow trout has always been the predominant species stocked and since 1991 the only species stocked by CDFG.

River, the creek channel becomes very steep and contains two water falls greater than 35 feet in height.

Water temperatures throughout Warm Creek are influenced by ambient air temperature and increase throughout the summer and begin to decrease during the fall. Mean temperatures vary little between sections of the creek upstream and downstream of the diversion, ranging from 6.6°C for both sections of the creek in October 2001 to 9.4°C and 9.5°C, respectively, in August 2001. Maximum water temperatures during 2001 were 13.1°C upstream of the diversion and 13.0°C downstream of the diversion, both well within the preferred temperature range of trout.

During October 2000, SCE used a modified Hess sampler to sample the benthic macroinvertebrate community. The results indicated that Diptera dominated the community both upstream and downstream of the Warm Creek diversion. The percentage of the benthic macroinvertebrate community composed of mayflies (Ephemeroptera), stoneflies (Plecoptera), and caddisflies (Trichoptera) – the EPT index – in runs downstream and upstream of the diversion were similar, 23.2 versus 23.0, respectively. However, overall benthic macroinvertebrate and EPT densities were lower downstream of the diversion compared to upstream of the diversion (table AR-3). [Note that riffle habitat, which generally tends to be more productive benthic macroinvertebrate habitat, was only sampled upstream of the diversion dam (no riffles were available for sampling downstream of the diversion).] Since flows during 2000 in Warm Creek were not diverted (i.e., flows upstream equaled flows downstream of the diversion), SCE concluded that the benthic macroinvertebrate community differences were likely due to differing habitat types above and below the diversion. During 2001, SCE did further investigations into the benthic macroinvertebrate community using the California Rapid Bioassessment protocol. However, the results are not available at this time.

Table AR-3. Summary of densities (number per meter) and EPT indices of Vermilion Valley benthic macroinvertebrates, October, 2000. (Source: SCE, 2001a, as modified by staff)

	<i>Upper Warm Creek</i>		<i>Lower Warm Creek</i>	<i>Cold Creek</i>	<i>Boggy Meadow Creek</i>	<i>Upper Mono Creek</i>	<i>Lower Mono Creek</i>
	<b>Riffle</b>	<b>Run</b>	<b>Run</b>	<b>Riffle</b>	<b>Run</b>	<b>Riffle</b>	<b>Riffle</b>
Total benthic macroinvertebrates in Sample <sup>a</sup>	2,893.8	14,832.4	4,016.9	1,067.4	19,615.4	241.7	5,786.6
EPT Densities	1,349.4	3,413.6	932.3	352.4	3,786.1	226.6	73.8
EPT Index <sup>a</sup>	46.6	23.0	23.2	33.0	19.3	93.8	1.3

<sup>a</sup> Does not include branchiopods, copepods, and ostracods in densities and EPT indices.

During the electrofishing studies that SCE conducted in 2000, only rainbow-golden trout hybrids were collected in Warm Creek. A total of 33 individuals were collected downstream of the diversion with 40 individuals collected upstream. Both the upper and lower Warm Creek had a mixture of primarily 1, 2, and 3-year old with some young-of-the-year (YOY) as well, suggesting that this species is successfully reproducing within the creek (see pages E-24, E-62 and E-63 of SCE's license application). Calculated densities (table AR-4) were greater upstream of the diversion than downstream. SCE concluded that these differences may be due to the differences in habitat or channel condition between the two stream segments. SCE believes that the densities, 440 and 374 total fish/km for the upper and lower Warm Creek, respectively, however, compared favorably with other trout densities reported upstream of SCE's Kern River No. 3 Project (FERC No. 2290) on the North Fork Kern River (40-146 total fish/km).

Table AR-4. Fish species capture totals and estimated abundance in Vermilion Valley area streams, 2000. (Source: SCE, 2001a)

<i>Stream</i>	<i>Species<sup>a</sup></i>	<i>Size Range (mm)</i>	<i>Estimated Population<sup>b</sup></i>	<i>Fish/km (estimate)</i>
Boggy Meadow Creek	BN	28-236	84	848
	RT	41-350	14	141
	BK	65-220	57	576
Cold Creek	BN	55-427	60	632
	RT	100-220	7	74
	BK	153	1	11
	Hybrid	154	1	11
Lower Mono Creek	BN	60-279	136	1,259
	RT	220-300	28	259
Upper Mono Creek	BN	39-569	426	2,462
	RT	52-200	68	393
	BK	65-254	42	243
Lower Warm Creek	Hybrid	62-168	34	374
Upper Warm Creek	Hybrid	33-203	40	440

<sup>a</sup> BN = Brown Trout, RT = Rainbow Trout, BK = Brook Trout, Hybrid = Rainbow X Golden Trout Hybrid

<sup>b</sup> Population estimates were derived by using USFS's MICROFISH program (ver. 3.0) (1986).

### **Mono Creek**

Upstream of Lake Edison, the habitat in Mono Creek is high gradient with small

waterfalls and shallow pools. Typical water velocities range from moderate to fast, and the majority of the in-channel substrate is bedrock and boulders with some areas of cobble and gravel. Downstream of Lake Edison, the first 1,300 feet of Mono Creek is a human-made channel with rip-rap and boulders lining the channel and forming the dominant substrate. Below the modified channel, the natural creek bed runs for 6,200 feet and is high gradient before it drops to low gradient near a hairpin meander just upstream of a gaging station. Lower Mono Creek is dominated by boulder and cobble substrate, except in the vicinity of the hairpin meander where flows decrease and gravel bars exist. The gravel bars are important, as suitable trout spawning habitat is limited within this section of Mono Creek. Thus, these gravel bars provide the primary spawning habitat for the self-sustaining population of brown trout found in lower Mono Creek. A minimum flow of 10 cfs is currently required in lower Mono Creek, however, since this portion of the creek is used as a conveyance of water from Lake Edison to the next downstream hydroelectric project, flows are usually much greater than the minimum.

Temperatures vary between upper and lower Mono Creek. In upper Mono Creek, the water temperatures generally reflect the influence of air temperature; increasing during the summer and decreasing during the fall. During 2001, a maximum temperature of 17.8°C occurred during August. During the summer of 2001, temperatures downstream of Lake Edison were generally cooler than upstream as a result of releasing deep cold water stored in the lake. During the fall, as the lake loses its stratification and warm surface waters are mixed throughout the water column, this warmer water is released downstream and the water temperatures in lower Mono Creek reflect this. During 2001, as air temperatures were dropping from August to September, the downstream water temperatures were increasing, reaching a maximum temperature of 17.6°C in September. At no time during 2001 did the water temperature in either lower or upper Mono Creek exceed the preferred temperature range of brown trout. However, temperatures downstream of Lake Edison during most of September did exceed the range preferred by rainbow trout.

Results from the October 2000 BMI study indicated that total BMI densities were lower in upper Mono Creek, than in lower Mono Creek (see table AR-3). However, the EPT density and index were much higher upstream of than downstream. Most of the BMI density was composed of dipterans in lower Mono Creek. During 2001, SCE conducted further investigations into the BMI community using the California Rapid Bioassessment protocol. However, the results are not available at this time.

Three species of fish were collected in upper Mono Creek during the October 2000 electrofishing survey. Brown trout was the most abundant species (80 percent) followed

by rainbow trout (12 percent) and brook trout (8 percent). The preponderance of brown trout captured probably reflects the timing of the survey during peak spawning season, with fish migrating out of Lake Edison to spawn, as fish captured were dominated by 4-year old fish. Downstream of Lake Edison, 147 fish composed of only two species were caught. Brown trout comprised 86 percent of the catch while rainbow trout made up the other 14 percent. A few YOY brown trout were captured indicating probable spawning within this creek section (most brown trout collected were 1, 2, or 3 years old); however, there were no rainbow trout YOY captured (all rainbow trout collected were estimated to be 2 years old). The condition factors for trout caught in lower Mono Creek were similar to those for trout caught in upper Mono Creek.

CDFG stocked lower Mono Creek with trout since at least 1955 and manages the creek as a “put and take” fishery for rainbow trout. From 1994 to 2000, CDFG stocked 21,940 catchable (150-mm or greater in length) rainbow trout. While harvest information is unavailable, a limited creel survey conducted in 2000 supports that the recreational trout fishery in Mono Creek and the other project waters is highly valued.

### **Boggy Meadow Creek**

For most of the year, Boggy Meadow Creek is characterized by a low base flow of about 0.2 cfs or less. During spring run-off periods, however, creek flows are augmented by diversions from Warm Creek. The Warm Creek diversion channel that conveys these flows is an artificial channel created by a stream gate weir. The substrate upstream of the weir is predominantly fine sediment. Downstream of the diversion, the channel is steep with high gradient riffle, run, and plunge pool habitat.

Boggy Meadow Creek has a non-turbulent flow and provides an easy migration route for trout from Lake Edison. The creek has a low to moderate gradient and is dominated by run habitat with scattered scour pools. During the year 2001, water temperatures remained within the preferred temperature range of the trout species found in the project waters. Average monthly water temperatures ranged from 10.6°C in August to 6.2°C in October, with a maximum temperature of 14.4°C recorded in August. The Boggy Meadow Creek BMI community was sampled from run habitat and, in terms of major taxonomic groups, was similar to that found in Warm Creek upstream of the diversion. While the EPT densities and index were similar between the two creeks, the species composition varied greatly, with Ephemeroptera and Plecoptera being more abundant in Boggy Meadow Creek and Trichoptera being more abundant in Warm Creek.

During SCE's 2000 electrofishing survey, 3 species and 134 individuals were

captured in Boggy Meadow Creek. The fish community consisted of brown trout (50 percent), brook trout (40 percent), and rainbow trout (10 percent) (table AR-1). The majority of the fish captured were YOY brown trout followed by YOY brook trout. YOY rainbow trout were also captured in the creek, suggesting that all three species successfully use Boggy Meadow Creek as a spawning ground. The abundance of YOY also suggests that Boggy Meadow Creek, along with Mono Creek, is a primary supply of wild brown trout recruits in Lake Edison.

### **Cold Creek**

The habitat composition of Cold Creek consists primarily of steep gradients and turbulent flows with riffles, runs, and scattered pools. Substrate is dominated by bedrock, boulders, cobble, and some gravel.

Mean monthly water temperatures in Cold Creek did not exceed the preferred temperature range for brown trout, rainbow trout, or brook trout during 2000 or 2001. However, monthly maximum temperatures did exceed the preferred range for brook trout during July 2000 and for both brook and rainbow trout during August 2000 and June, July, and August 2001. Mean monthly temperatures were below the preferred range for brook trout throughout the entire 2 year sampling period and were also below the preferred range for brown and rainbow trout during the months of October and November 2000.

In Cold Creek, macroinvertebrates were sampled from riffle habitat and were dominated by dipterans. Due to the abundance of dipterans, the EPT index was lower than those calculated for riffles in upper Mono Creek or Warm Creek upstream of the diversion (table AR-3). The EPT densities were much greater than those found in upper Mono Creek; however, they were less than those calculated for Warm Creek upstream of the diversion or Boggy Meadow Creek.

The 67 fish captured during the 2000 fishery survey were comprised of brown trout (88 percent), rainbow trout (10 percent), brook trout (1 percent), and rainbow-golden trout hybrids (1 percent). The abundance of brown trout in the creek was probably enhanced due to the coincident time of spawning and sampling, as the brown trout consisted mostly of 2 and 5 year old fish. There were also very few young fish found in the creek; possibly an artifact of the time of year and availability of cover, they had already migrated downstream to the lake, or they are just scarce.

#### **b. Environmental Effects:**

## **Minimum Flows to Regulated Reaches**

### Lower Mono Creek

SCE proposes to continue its minimum flow release of 10 cfs from the Vermilion Valley dam to lower Mono Creek. It asserts that there have been no identified effects of project operations on the fish community in lower Mono Creek and this stream supports a self-sustaining brown trout population that is in good condition under the current flow regime.

The FS preliminary Section 4(e) condition 12 A would require that SCE meet both a 7-day average and an instantaneous minimum streamflow requirement that vary during the year. From September 15<sup>th</sup> through December 15<sup>th</sup>, condition 12 A would require a 7-day average release of 25 cfs, with instantaneous flows no lower than 20 cfs. From December 16<sup>th</sup> to April 30<sup>th</sup>, the required 7-day average release would be 18 cfs, with instantaneous flows no lower than 15 cfs. And, from May 1<sup>st</sup> through September 14<sup>th</sup>, the 7-day average flow release would be 20 cfs, with instantaneous flows no lower than 16 cfs.

CDFG makes a 10(j) recommendation that the Commission consider flow regimes of a magnitude equal to or, preferably, greater than the actual flows that have occurred under the existing license. Although a specific recommended flow is not stated, CDFG's supporting text suggests it believes that flows of 20 to 25 cfs may well provide better habitat quality and quantity and may therefore support a greater level of natural trout reproduction.

SWRCB recommends that we analyze the seasonal hydrograph and minimum flow requirements for rainbow trout reproduction and survival in Mono Creek. SWRCB notes that the managed project late season, high flow, releases reduce the available habitat for rainbow trout fry. Finally, SWRCB concludes that project operations have a substantial negative influence on the ability of rainbow trout to successfully reproduce in lower Mono Creek because of the managed spring and late season (October to April) flows.

### Warm Creek

SCE currently maintains a year-round minimum flow of 0.2 cfs, or the natural flow, whichever is less, downstream of the Warm Creek diversion dam and proposes to continue this flow regime under the terms of a new license.

The FS would require that SCE continue releasing 0.2 cfs from the Warm Creek diversion dam to lower Warm Creek on a year-round basis as measured at USGS gage 11231700.

### *Our Analysis*

We base our analysis of minimum flows in project-affected reaches on information provided in SCE's license application, including the results of an Instream Flow Incremental Methodology (IFIM) Physical Habitat Simulation Model (PHABSIM) for lower Mono Creek. The study design was developed in consultation with the FS, SWRCB, and CDFG. Key PHABSIM input includes site specific depth, velocity, and substrate data as well as Habitat Suitability Criteria (HSC) for targeted species and life stages. Model output is weighted useable area (WUA).

To assess the influence of flow on rainbow trout and brown trout spawning habitat, SCE used general HSC developed by Bovee in 1978 to support implementation of the IFIM (Entrix, Inc., 2001). These HSC were used to provide a basis for comparison with a previous (1984) IFIM study that SCE conducted in streams influenced by the Big Creek System, which includes the Vermilion Valley Project. SCE also used trout spawning HSC developed by Smith and Aceituno for the Mono Basin, which is adjacent to the watershed of the Vermilion Valley Project (Entrix, Inc., 2001).

We consider HSC based on observations made within or in close proximity to the project to be most reflective of spawning habitat preferences of trout in project waters, and therefore we rely on the WUA estimates based on the Smith and Aceituno HSC in our analysis.

SCE used HSC developed by Bovee and Wise, Lifton, and Voos to assess the influence of flow on rearing habitat for adult, juvenile, and fry lifestages of rainbow and brown trout (Entrix, Inc., 2001). The Bovee HSC was used to provide a basis for comparison with SCE's IFIM study. The HSC developed by Wise, Lifton, and Voos in 1997 and referred to as the Altered Flows Preference (AFP) criteria, are based on data collected within waters of the Big Creek System and other nearby watersheds (Entrix, Inc., 2001). As with the spawning HSC, we consider the AFP criteria to be most reflective of trout rearing habitat preferences in project waters and rely on WUA estimates based on this criteria in our analysis.

### Lower Mono Creek

Regarding minimum flows, SCE points out in its August 29, 2002, letter to the Commission that the fisheries in lower Mono Creek are in good condition. This fishery consists of a naturally reproducing population of brown trout and adult rainbow trout that are stocked by CDFG. The average condition factor (a ratio based on individual fish weight and length) for brown trout collected in upper Mono Creek ranged from 1.04 to 1.20 (depending on the age of the fish) and the average condition factor for brown trout in lower Mono Creek was 1.17 (condition factors were calculated for only one age grouping). The average condition factor for rainbow trout in upper Mono Creek ranged from 1.07 to 1.20 whereas in lower Mono Creek, the average condition factor was 1.20. The condition factor of trout in upper Mono Creek, which is uninfluenced by project operations, is similar to that of trout in lower Mono Creek. This indicates that the availability of food for trout is comparable in upper and lower Mono Creek, or at least that food availability is not a limiting factor. Although food may be abundant in both these reaches, based on our review of BMI sampling data, the dietary composition may be different (there were substantially more dipterans in lower Mono Creek).

We evaluated brown trout spawning habitat for lower Mono Creek as a whole and at a short stream reach judged by resource agencies to represent unique spawning habitat, relative to the rest of lower Mono Creek. The maximum brown trout spawning WUA for the reach as a whole is 329 square feet/1000 feet of stream (which occurs at flows of 70 and 80 cfs), whereas the maximum WUA for the unique spawning reach is 10,574 square feet/1000 feet of stream (which occurs at flows of 120 cfs). WUA for brown trout spawning for the range of modeled flows is shown on figures AR-1 and AR-2. The existing minimum flow, and that proposed for future operations by SCE is 10 cfs. CDFG's minimum flow recommendation is somewhat unclear but it appears to be for a year round minimum flow of from 20 to 25 cfs. The minimum flow regime FS would require would also range between 20-25 cfs during fall when trout spawning is likely to occur. Table AR-5 shows WUA for brown trout spawning at a range of flows that includes the flows proposed or recommended.

The CDFG and FS flow regimes would provide more WUA for brown trout spawning than SCE's proposed 10 cfs, especially at the unique spawning habitat reach. The maximum WUA for brown trout spawning is achieved at flows of about 100 cfs. Under existing conditions, flows in lower Mono Creek are near or above 100 cfs from October through April about 50 percent of the time (see figure WR-3). Therefore, while flows are be nearly optimal for brown trout spawning under existing conditions, increasing the minimum flow from 10 cfs to the 20-25 cfs range to support brown trout fall spawning and average flow releases of 18 cfs that would be required by FS to support

egg incubation over the winter should provide protection during dry water years when flows released from the Vermilion Valley dam are typically at the minimum of 10 cfs. Currently, the amount of spawning habitat in lower Mono Creek is relatively small, and we conclude that it is likely that the limited amount of successful spawning is what constrains the size of the brown trout population in this reach.

Table AR-5. Brown trout habitat (WUA) in lower Mono Creek at selected flows (Source: SCE, 2001a)

Flow (cfs)	Spawning <sup>a</sup>		Fry		Juvenile		Adult	
	WUA (ft <sup>2</sup> /1000ft of stream)	% max- imum WUA						
10 <sup>b</sup>	99(3,826)	30(36)	4,150	94	2,671	51	1,806	37
20	136(6,310)	41(60)	4,372	100	3,366	64	2,417	50
30	166(7,166)	50(68)	4,367	100	3,825	73	2,839	59

<sup>a</sup> Primary value is for all of lower Mono Creek; values in parenthesis are for the unique spawning reach.

<sup>b</sup> Values for 10 cfs extrapolated from the model output for 8 and 12 cfs.

Brown trout fry are expected to emerge from the gravel during May or June. Fry are perhaps the most susceptible life stage to high flows, as is clearly evident in the WUA curve (figure AR-4). All proposed minimum flow regimes for the summer would be either optimal or nearly optimal for brown trout fry (table AR-5). Under current conditions, the lowest flow releases of the year occur during May and June (see figure WR-3), which favors trout fry survival at their most vulnerable time, shortly after emergence from the gravel. We conclude that, during May and June, existing flows do not normally limit trout fry survival, but that, during July and August, flows are often higher than those needed to produce optimum conditions for fry. Under pre-project conditions, flows typically would be substantially higher (between about 250 and 800 cfs) during May and June, and considerably less suitable for trout fry survival (see figure WR-3).

Flows in excess of 100 cfs in lower Mono Creek would support brown trout juveniles and adults (see figure AR-4). These flows typically occur at the project during much of the year during most water year types (see figure WR-3). The minimum flow

regime FS would require would provide a measure of juvenile and adult brown trout habitat protection during dry years (see table AR-5).

We also assessed whether establishing a flow regime that would be supportive of establishing a wild rainbow trout population in lower Mono Creek could be possible, in response to the SWRCB's comment. Rainbow trout typically spawn from April through June in the project area. Flows for optimal rainbow trout spawning are higher than for brown trout; 120 cfs for the reach as a whole (figure AR-1) and 300 cfs for a known gravel bed (the "unique spawning habitat") near a hairpin bend in lower Mono Creek (figure AR-2), where most trout spawning likely occurs. Under current conditions, flows during April exceed 100 cfs nearly 50 percent of the time (figure WR-3). This flow is nearly optimal for rainbow trout spawning for the reach as a whole (94 percent of the maximum WUA) but would still only provide 58 percent of the maximum WUA in the unique spawning reach (table AR-6). After April, the same low flows that would favor brown trout fry survival as they emerge from the gravel during May and June would be suboptimal for rainbow trout spawning, and the minimum flow regime FS would require and CDFG recommends would provide only a minimal increase in the degree of rainbow trout spawning habitat protection (table AR-6). Therefore, to provide favorable habitat for rainbow trout spawning and incubation, a minimum flow of at least 100 cfs would need to be provided from April through July, which no party has proposed or recommended.

Table AR-6. Rainbow trout habitat (WUA) in lower Mono Creek at selected flows (Source: SCE, 2001a)

Flow (cfs)	Spawning <sup>a</sup>		Fry		Juvenile		Adult	
	WUA (ft <sup>2</sup> /1000ft of stream)	% max- imum WUA						
10 <sup>b</sup>	83(569)	27(5)	5,928	99	3,742	69	2,047	50
20	86 (1,234)	28(11)	5,935	99	4,475	83	2,560	62
30	125(1,371)	41(13)	5,715	96	4,881	90	2,904	71
100	285(6,278)	94(58)	4,055	68	5,350	99	3,822	93

<sup>a</sup> Primary value is for all of lower Mono Creek; values in parenthesis are for the unique spawning reach.

<sup>b</sup> Values for 10 cfs extrapolated from the model output for 8 and 12 cfs.

CDFG only stocks adult rainbow trout in this reach, which is intended to support a

put and take fishery. Existing flows during May and June, which typically are about 30 cfs (see figure WR-3), although nearly optimal for brown trout fry, only provide 71 percent of the maximum WUA for adult rainbow trout (see table AR-6). However, during the most intensive recreational use period, July and August, existing flows exceed 200 cfs at least 50 percent of the time and are near optimal for adult rainbow trout (see figures WR-3 and AR-3). Flows continue to be near optimal for adult rainbow trout through April. The absence of fry and juvenile rainbow trout in SCE's fish collections strongly suggests that few, if any, of the stocked trout survive the winter and spawn in lower Mono Creek thus negating the need for a minimum flow release for rainbow trout spawning.

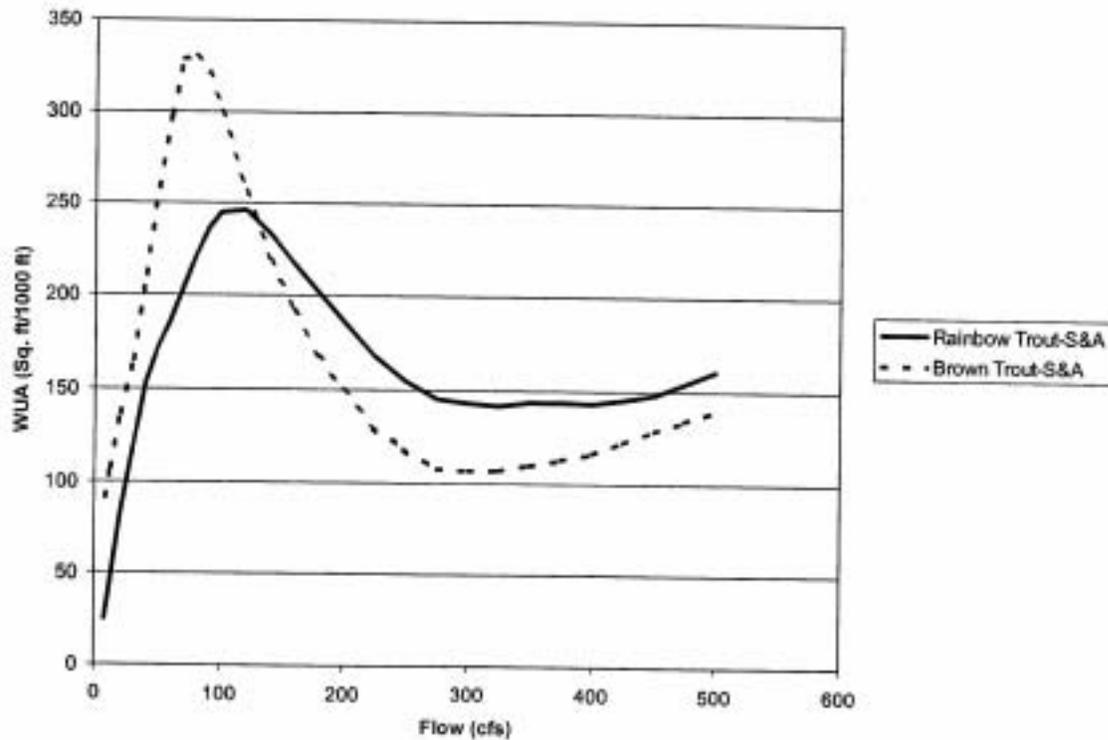


Figure AR-1. Rainbow trout and brown trout spawning WUA based on Smith and Aceituno criteria and representative habitats for lower Mono Creek. (Source: SCE, 2001)

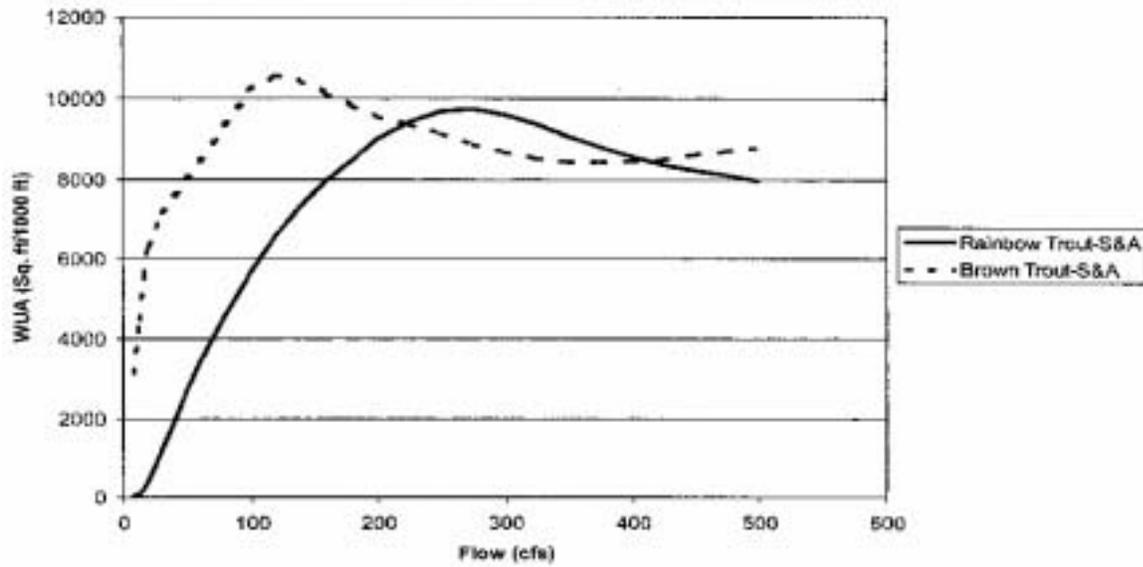


Figure AR-2. Rainbow trout and brown trout spawning WUA based on Smith and Aceituno criteria and unique spawning habitat for lower Mono Creek.(Source: SCE, 2001)

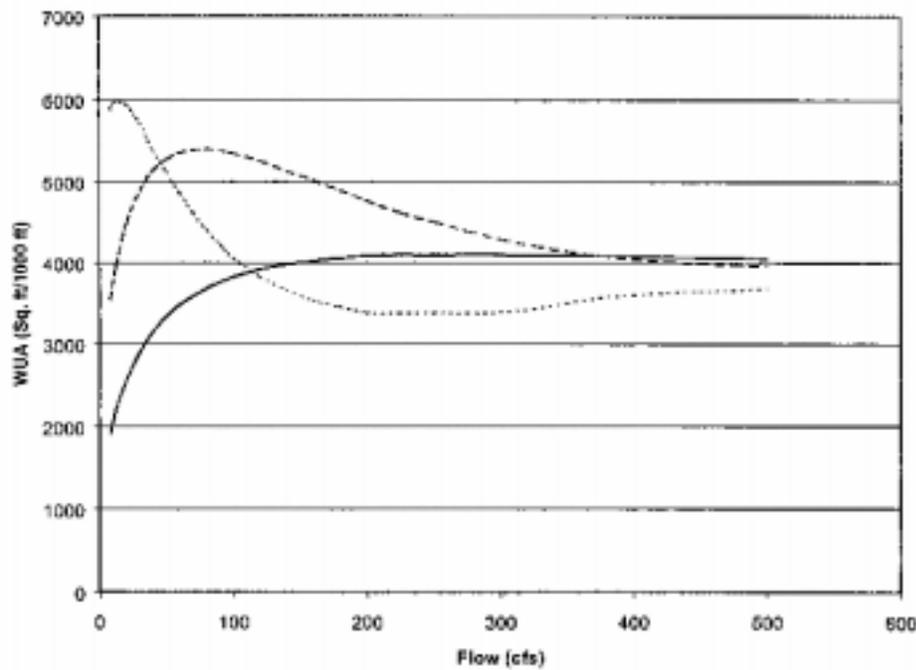


Figure AR-3. Rainbow trout rearing WUA based on AFP criteria for lower Mono Creek. (Source: SCE, 2001)

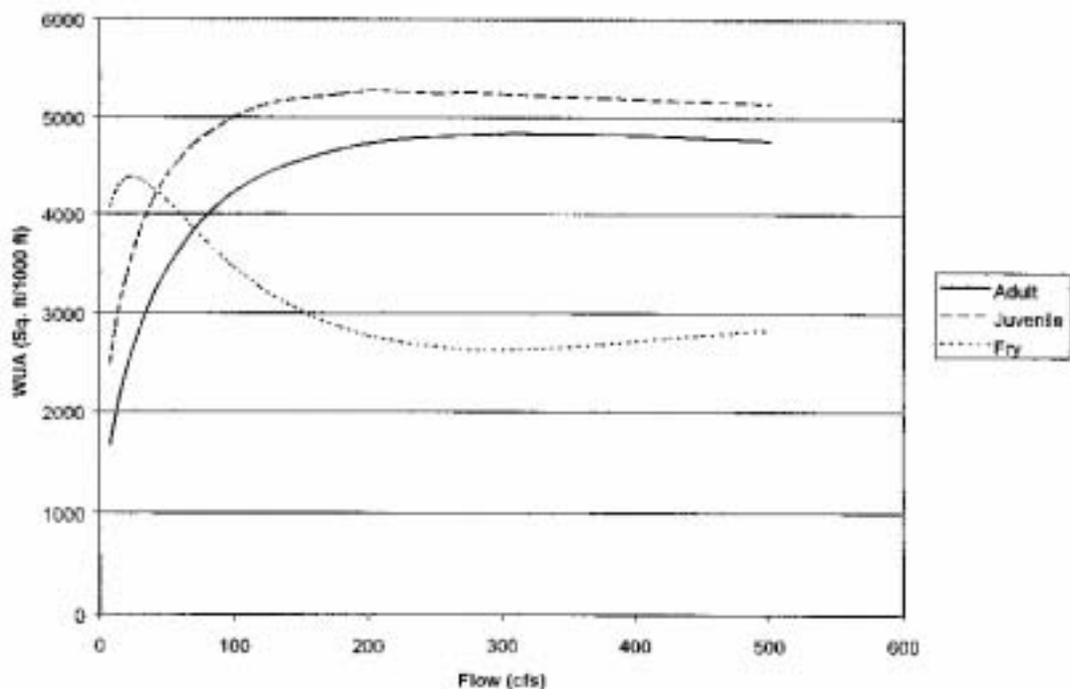


Figure AR-4. Brown trout rearing WUA based on AFP criteria for lower Mono Creek. (Source: SCE, 2001)

### Warm Creek

When flows are diverted to Boggy Meadow Creek, flows in lower Warm Creek are frequently less than 1 cfs (see table WR-3). SCE's current minimum flow requirement is to release 0.2 cfs or inflow, whichever is less. If inflow is less than 0.2 cfs, SCE is not able to divert any flow to Boggy Meadow Creek, and all flow is passed downstream to lower Warm Creek. Flows less than 0.2 cfs have been released during May, July, August, September, October, and November (see table WR-3), indicating that Warm Creek flows naturally are very low on a periodic basis. The small population of rainbow X golden trout hybrids that inhabit this stream seem to have adopted to this periodic low flow regime as evidenced by successful natural reproduction and rearing (see table AR-4). Most likely, during low flow periods, the trout hold in deep pool and run habitat.

A potential consequence of low flows is that, during the summer, small volumes of water are more prone to warming from ambient air temperatures. However, our review of SCE's temperature monitoring results indicates that water temperatures in lower Warm Creek are similar to upper Warm Creek (see table WR-7) and within the preferred temperature range for rainbow trout (between 7.3 and 14.6 °C), which we consider representative of the range for the hybrid trout that reside in Warm Creek.

Although flow diverted from Warm Creek may reduce available aquatic habitat in lower Warm Creek, it may contribute to available habitat in Boggy Meadow Creek. The results of fish sampling in Boggy Meadow Creek in 2000 shows that successful trout reproduction had occurred and the density of YOY of brown, brook, and rainbow trout was relatively high, compared to other project streams. However, flows from Warm Creek were not diverted into Boggy Meadow Creek in 2000, consequently, it is not possible to directly assess whether or not increased flows caused from diverting Warm Creek water to Boggy Meadow Creek represents an enhancement to the aquatic habitat of the latter stream.

Based on our review of available information, we find no evidence that the existing minimum flow requirement of 0.2 cfs has a substantial adverse influence on aquatic habitat in lower Warm Creek.

### **Seasonal High Flows in Regulated Reaches**

We base our analysis of seasonal high flow needs in project-affected reaches on information provided in SCE's license application, as well as its supplemental filing dated November 2001 (SCE, 2001b). SCE conducted specific studies to evaluate the fluvial geomorphology to describe the channel morphology, sediment transport regime, channel maintenance flows, and the effects of project operations. The areas analyzed include project-affected Mono Creek downstream of Lake Edison and Warm Creek. SCE's stream reach comparisons used the Rosgen Level II methodology for channel classification, bankfull indicators, documentation of large woody debris presence and function, degree of vegetation encroachment, and the classification and collection of sediment samples. SCE study designs were developed in consultation with the resource agencies.

#### Lower Mono Creek

SCE does not propose any seasonal high flow releases to lower Mono Creek for flushing and channel maintenance purposes.

In preliminary Section 4(e) condition 12 D, the FS would require that, between June 15<sup>th</sup> thru July 31<sup>st</sup> each year, SCE release from the Vermilion Valley dam to lower Mono Creek average daily channel maintenance flows that range from 150 to 450 cfs over a 15-day period. The 12 D maintenance flows would include an average daily flow of 450 cfs over two consecutive days and a minimum of 14 days of average daily flows

greater than 150 cfs, with a total flow volume within the period of 900 ac-ft (see appendix B).

CDFG makes a 10(j) recommendation that consideration should be given to providing seasonal high flows in Mono Creek to maintain the natural floodplain and perform channel maintenance, food production, and other ecological functions.

SWRCB notes that the managed project low flow releases to lower Mono Creek during the spring, when unregulated flows would typically be high, likely prevents successful spawning by rainbow trout, which spawn in the spring. SWRCB recommends that we analyze the effects of the current ramping rates associated with flow changes to lower Mono Creek and whether lack of sufficient spawning gravel may be adversely influencing rainbow trout reproduction in lower Mono Creek.

### Warm Creek

Currently, SCE releases water to the capacity of a 6-inch pipe through the Warm Creek diversion dam for a period of 72-hours on, or about, May 1 of each year. No changes are proposed for the term of the new license.

The FS would require that SCE leave the Warm Creek diversion set so that flow is released to the natural channel until July 31<sup>st</sup> in wet water years, based on the April 1<sup>st</sup> forecast for the San Joaquin Four Rivers Index.

SWRCB states that although SCE passes some channel maintenance and building flows under its current operating regime, these flows may not be of sufficient volume or frequency to maintain critical pool and deep run habitat for adult trout. SWRCB indicates that the Commission should analyze the magnitude and frequency of channel maintenance flows necessary to protect the cold freshwater habitat downstream of the diversion.

### *Our Analysis*

### Lower Mono Creek

SCE estimates that bankfull discharge in lower Mono Creek is between 335 and 468 cfs. In its analysis of channel maintenance and riparian flow for the Vermilion Valley Project, dated August 30, 2002, the FS agrees with SCE that current bankfull flows are in the range of 450 cfs and has developed its 4(e) condition for lower Mono Creek seasonal high flows accordingly. FS also agrees that the existing channel

morphology has adjusted to these flows.

SCE estimates channel maintenance flows to be between 438 and 656 cfs. Fine grained particles and sand movement is initiated at flows of only 1 to 4 cfs and gravel that is suitable for trout spawning (<32 mm diameter) initiates movement at flows of about 100 cfs in higher gradient areas, which occur on a regular basis in lower Mono Creek. Larger gravel (80 mm diameter) would only initiate movement at flows of from 500 to 1,000 cfs. In lower gradient areas of lower Mono Creek, such as the gravel bed near the hairpin turn, flows in the range of 500 to 1,000 cfs, or greater, would be needed to initiate downstream movement of gravel up to 32 mm diameter.

Under the preliminary condition 12 D, FS would require SCE to continue to operate the project in a manner similar to current operations. According to SCE's Index of Hydrologic Alteration (IHA) analysis, annual extreme flow events of seven days in duration entailed flows of 505 cfs under post-project conditions (SCE, 2001b). Therefore, under current operations, flows that exceed bankfull conditions for at least seven days in duration occur on an annual basis. Consequently, we conclude that fines would be flushed from spawning gravel, and spawning gravel would be redistributed under current conditions.

In their August 30, 2002 submittal, FS suggest that flooding of flood prone areas maintains productivity by moving nutrients from the flooded riparian zone into the active channel. However we note that, under existing conditions, there would be little deposition of fine material into the riparian zone, which would support enhancement of riparian habitat, because most fine material is expected to be deposited in Lake Edison and not available to lower Mono Creek.

Condition 12 D does not require SCE to not make high flow releases if they made them the year before. However, the condition does not adjust the releases to account for extended dry periods. We examined the flow records over the past 20 years to see whether SCE could meet the high flow releases FS would require in condition 12 D. From our analysis, we conclude that during years such as 1976-1977 and 1991-992, when dry or critically dry years occurred back to back, SCE may not be able to meet condition 12 D as it is now written.

### Warm Creek

SCE estimates that bankfull discharge values range between 31 and 84 cfs and that corresponding channel maintenance flow ranges from 25 to 64 cfs (based on analysis of

low gradient reaches of the stream). Fine-grained particles are mobilized at 1 cfs and flows ranging from 3 to 37 cfs are needed to mobilize 32-mm diameter gravel (considered ideal for trout spawning). SCE acknowledges that fine-grained sediment accumulation is relatively common in the low-gradient reaches, but concludes that such fines are periodically mobilized by high flows because there is a lack of woody debris in such areas (it is deposited higher up on the river banks).

SCE is now required to release flows equal to the capacity of a 6-inch diameter pipe for 3 days on, or about, May 1 of each year. Based on the maximum expected head at this pipe, we estimate that this equates to a release of about 0.5 cfs. Therefore, based on our analysis, this flow does not serve either channel maintenance purposes or to flush fine-grained particles from areas that may be suitable for trout spawning.

However, that does not necessarily mean that flows that would serve this function do not occur. As noted in our discussion of Warm Creek in section V.C.1, Water Resources, the discharge gage downstream of the diversion, typically does not operate between October through April, and the gage in the diversion channel only operates when flows are diverted, which normally occurs from about mid-April through August. Therefore, undocumented channel maintenance and flushing flows may already be occurring during many years. Unfortunately, establishing a stream gaging station on a low discharge stream that could withstand the typical deep snow cover and cold water temperature that occurs at the high elevation of the Vermilion Valley Project during the winter and early spring is technically challenging.

In preliminary section 4(e) condition 12 D, the FS would require that SCE continue releasing flow to the natural channel during wet years until July 1<sup>st</sup>. After reviewing the hydrologic records for the past 30 years (from 1974 to 2003), FS estimates that wet year water types have occurred 40 percent of the time, based on the San Joaquin Rivers Index. With the high discharges and long durations of these wet year flows, FS concludes that such flows would be high enough to meet FS objectives for improving aquatic habitat in Warm Creek. Based on our analysis, we agree that such flows should be able to mobilize and transport spawning gravel and provide overbank flows that would serve to maintain floodplain and riparian habitat. SCE's IHA analysis shows that most of these wet years have peak flows in the 25-64 cfs range that SCE says is needed to maintain the channel and flush fine sediment and spawning size gravel. We note that Warm Creek Meadow, through which lower Warm Creek flows, would likely benefit from such periodic flooding.

### **Ramping of Mono Creek Flows**

In the current license, SCE is not required to follow a ramp rate for releases into Mono Creek and SCE does not propose a ramp rate be developed.

In preliminary section 4(e) condition 12 C, the FS would require SCE to develop a ramping rate to reduce effects of the recession limb of natural and operational spills into the Mono Creek reach. FS would require that SCE downramp at approximately the same rate as the natural attenuation of the inflow that caused the spill (i.e., no manipulation of reservoir levels and penstock releases during spills), or downramp slowly enough so as not to produce stage changes at any approved Project bypassed reach stage gage exceeding two-tenths of one foot per hour. Condition 12 C would require that SCE either: (1) hold the project reservoir spillway elevation and outflows (penstock diversion and instream flow diversion) magnitudes constant until the completion of the spill (i.e., flow over spillway ceases); and/or (2) develop a stage management protocol to manually manage the spill discharge into the project.

#### *Our Analysis*

SCE says that a ramping rate isn't needed for releases to Mono Creek channel because, unlike the highly variable releases from a powerhouse, SCE only releases flow into Mono Creek to convey the flow to downstream power projects for generation.

In discussing the reasons for this condition in the Section 4(e) rationale document, the FS says that since the releases are often made during the summer, when recreationists are present and when young-of-year fish are susceptible to stranding, a ramping rate is needed for both safety and habitat and species protection.

Though we agree that rapid changes in flow can leave recreationists at risk and rapid decreases in flow can strand young-of-year fish, FS presents no information in the rationale document to show that these flow changes are now occurring in Mono Creek under the existing license.

To comply with the ramping requirements of FS preliminary 4(e) condition 12 C, SCE would need to either: (1) develop a plan to down ramp natural spill flows over the Vermilion Valley dam spillway to Mono Creek; and/or (2) develop a stage management protocol for its operational releases (via gates) to Mono Creek. Due to the lack of project-specific information as explained above, we see no need for (2) and we question the need and practicality for (1).

Regarding (1), we note that the project doesn't have a penstock or any other mechanism to divert flow away from Mono Creek during spills. Using the project's Howell-Bunger type valve would only serve the purpose of releasing part of any "natural spill" into Mono Creek, which would then combine with the flows SCE would be releasing to Mono Creek from the spillway. To manage inflows large enough to cause the reservoir to spill, SCE would have to estimate the storm inflow and make releases accordingly. Not only would the reservoir level change as the spillway gate settings are changed but also the outflow from the project would change and approximate the natural inflows. So, we don't see how SCE could hold the project reservoir spillway elevation and outflows constant until the spill ends as FS would require. If SCE now follows this typical spill operation, they are allowing spill flows to reside naturally, which would seem to accomplish the FS's stated goal of downramping at the same rate of natural attenuation of inflow that resulted in spill.

### **Lake Edison Water Levels**

CDFG makes a 10(j) recommendation that SCE be required to maintain a minimum pool elevation during critically dry, dry, below normal, normal, and above normal water years. The specific pool elevations would be developed by SCE, in consultation with appropriate agencies. CDFG appears to base this recommendation on a statement that SCE made in the draft license application that suggests that in drier years spatial habitat in the project area may be limiting to fish populations. CDFG notes that Lake Edison is routinely severely drawn down by the fall, and then concludes that spatial habitat for fish may therefore be reduced substantially in Lake Edison during dry years, thus adversely affecting the lake fishery.

### *Our Analysis*

Lake Edison typically reaches its lowest level during March, although drawdown is typically well underway during the fall (see table WR-2). We are unaware of any evidence that the current drawdown regime is adversely influencing the affected trout populations. During the fall and winter, when the water temperature approaches freezing, the metabolism of trout slows down, which results in reduced activity and less need to forage. Consequently, the spatial requirements of trout that overwinter in Lake Edison are not as great as they would be in the summer, when the water is warmer. CDFG does not provide evidence that spatial habitat for trout in Lake Edison is reduced during dry years. Hydroacoustic surveys conducted by SCE indicate that most trout were found near the bottom, except in the deepest portions of the lake. This is expected, since most potential sources of food are also near the lake bottom. Although the volume of water is reduced

during the fall and winter drawdown, we expect that the primary result of this drawdown would be that trout colonize habitat near the bottom that during the summer was too deep and therefore less preferred for foraging.

CDWR typically does not have information to reliably determine the water year-type for the subsequent year until early spring, after the minimum lake level would have already been achieved.

### **Fish Monitoring**

SCE does not propose to conduct any fish monitoring after issuance of a new license for this project.

In preliminary Section 4(e) condition 12 F, the FS would require SCE to monitor the fish population every 10 years in lower Mono Creek, Warm Creek (upstream and downstream of the diversion dam), and Boggy Meadow Creek. The objective of this monitoring would be to determine the species composition in the project area and estimate for each species the abundance by life stage, and the size distribution. The results of the monitoring would be summarized in a report that includes a map of the monitoring stations, tabular results of the total number, average length and weight, estimated abundance and biomass with 95 percent confidence limits for each species, and a graph of the combined length-frequency distribution from all monitoring stations. The report would also provide a comparison of the current results with the previous fish population surveys for each monitoring site and a discussion of the implications regarding trends in fish abundance.

### *Our Analysis*

Monitoring would allow a determination of the response of fish populations to the changes in project operation that may be prescribed in any license issued, such as increased minimum flows and seasonal high flows. However, sampling once every 10 years, as the FS would require, would not allow for timely identification of major fish population shifts under any new flow regime.

### **Fish Stocking of Project Waters**

SCE proposes to continue stocking rainbow trout from its trout-rearing facility, in consultation with CDFG, to support recreational fishing in the project area. However, as stated in its September 4, 2002, letter to the Commission, SCE states that its participation

in fish stocking efforts is, and should remain, voluntary and should not be required as part of any new license that may be issued for this project.

CDFG makes a 10(j) recommendation that SCE provide 50 percent of the fish production costs that is needed to sustain a fishery in Lake Edison and Mono Creek, unless agreed otherwise by CDFG and SCE. CDFG notes that fisheries in the project area provide high-demand angling opportunities for recreational users of Lake Edison and other project stream reaches and SCE's contribution to the stocking costs would offset the effects of the annual seasonal drawdowns of Lake Edison and project-related stream flow reductions.

### *Our Analysis*

Project waters are stocked with trout in order to provide recreational fishing opportunities and harvest in excess of that which could be supported by the natural productivity of the project area. The fishery supported by this stocking is one of the important public benefits of this project. Our assessment of the existing fishery and fish stocking at the project are provided in Recreation Section

#### c. Unavoidable Adverse Effects: None

#### d. Cumulative Effects on Fisheries Resources

Altering the minimum flow regime, the seasonal flow regime, or the water level management of Lake Edison may cumulatively affect the amount of water available for downstream aquatic habitat and water uses.

Implementation of SCE's proposed measures, which would be a continuation of the current flow and Lake Edison water level management regimes, would result in no incremental cumulative effect on downstream fisheries resources and water quantity.

Raising instream flow would also result in no cumulative effect on fisheries and water resources downstream of the Warm Creek diversion. Although the FS minimum flow to lower Mono Creek would represent a seasonal increase over current conditions, on a monthly average basis, there would be little change evident. However, on a daily basis, there may be less variability of flow, which should enhance aquatic habitat in lower Mono Creek and result in increased production of wild brown trout. Much of the flow in lower Mono Creek passes through the Mono Creek Diversion into the Ward Tunnel, which discharges into the Portal forebay (FERC No. 2174). Trout produced in lower

Mono Creek could therefore contribute to fisheries in the Portal forebay, and to a lesser extent at other downstream lakes and reservoirs, including Huntington Lake, the Balsam Meadow forebay, and Shaver Lake. We conclude that implementation of the FS minimum flows would result in little discernable difference in the average available water quantity and associated aquatic habitat at downstream locations and that consequently there would be no resultant cumulative effect on this resource.

Both the FS and Commission staff conclude that the release of seasonal high flows to lower Warm Creek is appropriate. The release of such flows is expected to enhance trout production in lower Warm Creek. However, flow in Warm Creek passes over two waterfalls that are greater than 35 feet high near the confluence with the South Fork San Joaquin River. We expect that this vertical drop may cause injury or mortality to trout passing over these waterfalls, which could preclude a meaningful contribution of Warm Creek trout to the fisheries of the South Fork San Joaquin River.

### **3. Threatened and Endangered Species**

#### **a. Affected Environment:**

The red-legged frog and valley elderberry longhorn beetle are known to occur in Fresno County. However, focused surveys for amphibian species did not locate any listed species in the project area.

Based on the review of the California Natural Diversity Database, FS list of sensitive species, and available habitats at the projects, no other animal species other than the bald eagle (discussed below) are likely to occur in the project area<sup>10</sup>.

SCE conducted floristic surveys in the vicinity of project facilities, the bypass and flow-augmented streams, and project-related recreational facilities. No federally listed threatened or endangered species were located (SCE 2001, exhibit E, section 2.5.6)

The bald eagle, a federally listed threatened species, is known to inhabit the project area during the breeding season. During the summer of 2000, an adult eagle was seen

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<sup>10</sup> FS Section 4(e) condition 13 would require that SCE prepare a biological evaluation of the effects on FS sensitive and management species before any construction activities that may affect these species. Implementation of this measure would ensure protection of these species in the future.

perched in a large Jeffrey pine and soaring near the mouth of Cold Creek at the northwestern shore of Lake Edison and an immature eagle was sighted on the north shore of the lake. In 2001, an active nest with two fledglings was identified along the northwest shoreline of the lake. Because the elevation of the lake results in freezing conditions during the winter, no winter use of the project area by eagles is expected.

In California, most breeding occurs in the northern part of the state (Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity Counties). The number of breeding territories in California has increased from about 30 in 1977 to 151 in 1999. The nest at Lake Edison is one of the few confirmed eagle nests in Fresno County. No recorded nesting territories were recorded between 1959 and 1999 in the county.

Breeding generally occurs from February to July. Incubation begins from February to mid-march and nestlings are in the nest until end of June. The fledglings remain restricted to the nest from June through August.

Eagle foraging habitat generally consists of large bodies of water or free-flowing rivers with abundant fish and adjacent perch sites. Eagles are opportunistic feeders. Fish is the primary food of eagles; eagles also feed on waterfowl, mammalian carrion, and small birds and mammals.

b. Environmental Effects:

*Our Analysis*

**Red-legged Frog and VELB**

Red-legged frogs are found below 5,000 feet elevation and the valley elderberry longhorn beetle is found below 3,000 feet elevation. Since the project is located above 7,000 feet elevation, the project would have no effect on the red-legged frog or the beetle.

**Vernal Pool Species**

No vernal pools are found in the project area. Therefore, the project would have no effect on vernal pool species, such as the vernal pool fairy shrimp and vernal pool tadpole shrimp.

**Bald Eagles**

The project could potentially impact nesting eagles as a result of effects of project operation on food supply and the effects of disturbance from recreational boating and hiking, new recreational improvements, and project maintenance on nesting and foraging eagles.

### Food supply

Brown trout and rainbow trout are the dominant fish species in Lake Edison. CDFG stocks rainbow trout in Lake Edison (95,250 trout fingerlings in 2000) and in Mono Creek downstream of Vermilion Valley dam (3,455 catchable trout in 2000) which provides an abundant prey base for eagles. Reservoir fluctuations have the potential to affect eagle food supply. SCE, however, maintains stable summertime lake levels that avoid project-related effects on food supply during that time period.

### Disturbance

Eagle tolerance of human presence is highly variable, both seasonally and among individuals or pairs of eagles. Some bald eagles nest and tolerate the presence of people, boaters, hikers, roads and other human presence in very close proximity, possibly as a result of habituation.

During the early part of the nesting season, there is very limited recreational use in the project area because the road to Lake Edison doesn't open until late May because of snow conditions. Recreation primarily occurs from late May through the end of August. This is the period when fledglings are restricted to the nest and are fed by the parents. At this stage, they are less susceptible to human disturbance than during earlier stages of nesting (courtship and incubation) but could be affected by premature fledging and decreased prey delivery.

Noise and disturbance caused by boating activities in the lake could also affect eagle nesting and foraging. Boating primarily consists of motorized and non-motorized boat recreation and fishing. A 15-mile per hour speed limit is enforced on the lake. Since Lake Edison is located in a relatively remote location, it receives limited boat use. The Lake Edison boat launch, located near the western abutment of the dam, has a parking capacity of 40 spaces. Occupancy averages about 25 percent weekdays and 50 percent weekends. The number of boat trailers was as high as 16 at one time during 1999 surveys. Given the limited boating use and the size of the lake (4.7 miles long, 1,853 acres), insignificant effects on eagle foraging would be expected.

The Mono Creek trail, which runs along the north shore of the lake and provides access to the Pacific Crest Trail, is between 500 and 1,000 feet of the nest. The trail is operated by the Forest Service and is not located within the project boundary. Through a permit system, the Forest Service limits hikers to 36 per day. The steep, forested terrain between the trail and nest provides a visual screen and results in a low chance of hikers leaving the trail. SCE has no ability to implement protective measures if they were found to be necessary.

Improvements to existing recreational facilities could also potentially disturb bald eagles. Recreational construction (FS preliminary condition 14) includes improving the Vermilion campground, modifying the Lake Edison vista overlook, and modifying the Lake Edison boat launch and dispersed camping area. These facilities would be located more than 0.5 mile from the eagle nest and any improvements would be of a relatively minor nature with minimal construction. No eagle habitat would be affected. Therefore, no impacts to eagles are expected.

Regular maintenance activities include vegetation control (cleaning, trimming, and use of herbicides), road repair and grading, and hand removal of sediment. Given the minor scope and infrequency of these actions and the distance from the nest, no impacts are expected.

There are no transmission lines associated with this non-power-producing project; thus the project does not pose a collision or electrocution hazard to eagles.

SCE has implemented an Endangered Species Alert Program that includes identification and life history information about the eagle, identifies potential conflicts with project operations, maps of known endangered species location relative to facilities, procedures to follow for proposed activities that may affect eagles. Further, FS condition 7 would require SCE to prepare a biological evaluation before taking any actions that may affect federally listed species or FS sensitive species.

We conclude that continued operation of the Vermilion Valley Project would not be likely to adversely affect the bald eagle. No critical habitat has been designated for the eagle; thus no effects would result.

c. Unavoidable Adverse Effects:

None.

#### **4. Cultural Resources**

##### a. Affected Environment:

The Vermilion Valley may have been visited by roving bands of hunters more than 10,000 years ago. Occasional archaeological finds of Paleo-Indian period spear points are known from high elevation locations in the Sierra Nevada. Local Native American tradition holds that ancestors have always been in these mountains. Materials recovered from archaeological sites indicate regular use of locations like Vermilion Valley starting 7,000 to 5,000 years ago. Archaeologists' interpretations are that about 1,000 years ago, upland areas of the Sierra Nevada began to be more intensively used as Numic language speaking people spread westward from the Owens Valley. This Late Prehistoric occupation developed trans-Sierran trade routes, and settled into the pattern of lowland and upland permanently occupied villages and seasonal harvesting of high elevation resources observed by Americans and Europeans in the 18th and 19th centuries.

The Cultural History of the Southern Sierra Nevada places the Northern Paiute, and, south of the Mono Basin, the Owens Valley Paiute, along the eastern slope of the mountains. The separate languages of these two groups are classified as the Western Numic segment of the Numic branch of the Uto-Aztecan language family. The Foothill Yokuts (Penutian language speakers) occupied the western slopes up to 3,000 feet elevation. The western slopes from 3,000 to 7,000 feet elevation were occupied by the Western Mono. The Western Mono share a western Numic language with their eastern cousins, the Owens Valley Paiute.

Native American tradition and the results of archaeological investigations portray the Vermilion Valley as a hub in a network of prehistoric trade routes between the California Central Valley and the Great Basin. The Mono Trail passed through Vermilion Valley along Mono Creek, crested the Sierra at the 12,000 feet elevation Mono Pass, and proceeded east into the Owens Valley. Obsidian, acorns, dried salmon, baskets, and shell beads were exchanged between the Owens Valley Paiute and the Western Mono and, in turn, the Foothill Yokuts. In 1863, William H. Brewer with the Whitney Geological Survey team and a military escort, observed evidence that the food resources of the Vermilion Valley were being actively harvested and recorded in his diary that the valley was "a major Indian retreat, a natural stronghold protected by the Sierra Nevada Mountains and remote from White Settlement." Owens Valley/Round Valley Paiute resistance fighters, described as followers of Joaquin Jim, operated out of Vermilion

Valley from 1863 to 1865. No lands meeting the legal definition of Tribal Lands are located in the project area.

Native Americans residing in the general project area today may identify themselves as North Fork Mono (*Nim*) or Auberry Mono (*Posgisha*). The distinction represents a geographic distribution of people at contact. See also below for discussion of tribes and organizations who are participating in the consultation process. Currently, Owens Valley Paiute are centered on the Bishop Paiute-Shoshone Indian Reservation. The Picayune Chukchansi Rancheria (whose members are descendants of Northern Foothills Yokuts) is located near the community of Coarsegold, 40 miles west of the Vermilion Valley Project.

The first recorded contact with the Western Mono was with the Spanish Moraga expedition in 1806. Decimated by introduced European diseases, harassed by militias in the wake of the settlers who followed the gold rush, some Mono families managed to continue to use the high country in traditional ways (Lee 1998). This became more difficult as Basque shepherds and other live stock ventures ranged into the Vermilion Valley from 1870 to 1910. No evidence of historic timber harvesting has been defined in the Vermilion Valley but it is unlikely to have escaped impact from this industry in its 1880 to 1920 heyday. The Sierra Timber Reserve was established by Act of Congress in 1893 and in 1897 became the Sierra National Forest. By 1900, Forest Rangers were enforcing restrictions on private use of National Forest lands. The hydroelectric industry terminated even the possibility of using certain choice locales in traditional Native American ways. In 1911, the Pacific Light and Power Company began work on the Huntington dams. Its successor, Southern California Edison, continued the work which became the Big Creek Hydroelectric System, building the Vermilion Dam in 1953 and inundating the Vermilion Valley beneath the waters of Lake Thomas A. Edison.

### **Archaeological Investigations**

The initial archaeological work in Vermilion Valley was done in the 1950s at the invitation of SCE before the passage of laws that required that such work be done for federally licensed projects. Some of the work was funded by SCE (Lathrap and Shutler 1955, Wallace n.d.), some was undertaken independently (Avila and Hinds 1956, 1958). William and Edith Wallace surveyed the Vermilion Valley and Boggy and Warm Creeks in 1953 - 1954. They described 4 sites along Mono Creek and 4 sites along the Boggy/Warm Creek meadow. Subsequently, Avila and Hinds did some surface collection and wrote up formal site forms. During the construction of Vermilion Dam, excavations were done at site CA-FRE-115, described as a prehistoric village associated

with bedrock mortars. The results of the excavations were written up as a journal article (Lathrap and Shutler 1955) and an unpublished manuscript (Wallace n.d.).

During the 1970s and 80s, work was done by or for the Sierra National Forest, which included a number of small surveys and site record updates, as well as a test excavation to evaluate developments along Warm and Boggy Creeks and near Mono Diversion. The test excavations included work at CA-FRE-942/H, CA-FRE-1939, and CA-FRE-2470.

In 2000, Pacific Legacy, Inc., under contract to SCE, did a cultural resource inventory of about 1700 acres surrounding Lake Edison (Jackson, DeJoseph, and Morgan 2001). The survey was undertaken to provide the FERC and FS with information concerning all cultural resources that might be affected by relicensing the Vermilion Valley Project. Accordingly, the survey covered lands administered by the FS considerably beyond the project boundaries. The year 2000 surveys provided information about 25 archaeological sites and the Mono Trail. Of these 25 sites, 9 were identified as located within the project boundaries, 3 near the project boundaries, and one site (CA-FRE-115) was recommended as eligible to the NRHP. Additional work was completed by Pacific Legacy, Inc. in 2002, including evaluative testing of sites within the project boundaries, site boundary definition, and management recommendations (Morgan, Jackson, and Quick 2002). As a result of the 2002 investigations, two additional sites were recommended eligible to the NRHP (sites CA-FRE-256/293 and CA-FRE-3186). One of these (CA-FRE-3186) would be affected by continued operation of the project, the other (CA-FRE-256/293) would not. The results of the 2002 evaluative investigations are summarized in Table CR-1.

Table CR-1 Vermilion Archaeological Sites and Assessment of Effects.

<i>Site No.</i>	<i>Intact Deposit?</i>	<i>Deposit Constituents</i>	<i>Observations</i>	<i>NRHP Eligible?</i>	<i>Adverse Effects?</i>
FRE-115	Yes	Midden, Bedrock Mortars (BRM), obsidian debitage, pottery, tools, steatite artifacts	High data potential	Yes	Yes (Reservoir, vandalism)
FRE-136	Minimal	Obsidian debitage	Poor integrity; most of site redistributed by Lake Edison	Not recommended	
FRE-256/293	Yes	Midden, BRM, faunal remains, obsidian debitage, formed tools	Large site retaining data potential and integrity	Recommended	No
FRE-1939	Yes	Obsidian debitage	Fair integrity. Deposit is fairly sparse and does not	Not recommended	

			contain important data		
FRE-2470*	No	limited scatter	Site outside APE		
FRE-3174*	No	limited scatter	Site outside APE.		
FRE-3175	Minimal	Obsidian debitage	Poor integrity; most of site redistributed by L. Edison	Not recommended	
FRE-3177*	Minimal	Small quantity of obsidian debitage	Site outside APE		
FRE-3179	No	Small quantity of obsidian debitage	Poor integrity; most of site redistributed by Lake Edison	Not recommended	
FRE-3186	Partial	Obsidian debitage and bifacial tools, BRM	Fair integrity & moderate data potential; part of site redistributed by Lake Edison, core of site intact	Recommended	Yes (Reservoir)
VER-18	No	Small quantity of obsidian debitage	Site appears redistributed by Lake Edison	Not recommended	
<b>VER-19</b>	No	Small quantity of obsidian debitage	Site appears redistributed by Lake Edison	Not recommended	

\*Sites Located Outside the Project Boundaries

Site CA-FRE-115 has been recognized as an important archaeological site since the 1950s. It appears to be a seasonally occupied village site, which has evidence of prehistoric use going back several thousand years. Excavations at collapsed house structures show use of the site over the past 600 years and recovered trade beads and other material show use of the site through the contact period.

Test excavations at Site CA-FRE-3186 reveal a milling feature, abundant waste flakes from stone tool manufacture, a few finished stone tools, and a small area of archaeological matrix that may be a habitation area. Both CA-FRE-115 and CA-FRE-3186 are being affected by fluctuating water level in Lake Edison, lake shore recreation activities, and vandalism.

Site CA-FRE-256/293 is an extensive site with an abundant scatter of stone tool waste flakes, as well as some finished tools, faunal remains, ground stone tools, and well preserved archaeological matrix including habitation debris. The site is not located on the lake shore. No project maintenance or other project activities would occur within Boggy Creek (on the edge of the site) and no effects to the site are anticipated as a result of project relicensing.

## **Historic Sites**

SCE's book, "The Hardest Working Water in the World," (Shoup 1988) documents the National Register of Historic Places (NRHP) eligibility of the Big Creek Hydroelectric System. In 1993, the California SHPO concurred that the Big Creek Hydroelectric System District is eligible. Because the period of significance for the system is specified as 1911 - 1929, the Vermilion Dam and associated project facilities, which were constructed during the 1950s, do not contribute to the significance of the Big Creek Hydroelectric System NRHP district

Two of the archaeological sites recorded in SCE's 2000 inventory study included a historic component. Neither site was determined NRHP eligible and both sites are outside of the project APE. No other historic period sites were recorded in the project area.

## **Traditional Cultural Properties**

No Traditional Cultural Properties are currently defined in the APE. Consultation and research (see below) have not identified specific locations used in traditional ways by relatives or tribal affiliates of Native Americans residing in the project area. Studies associated with the ALP will continue and perhaps this situation will change.

Native American accounts and the archaeological studies indicate that the prehistoric Mono Trail ran through the Vermilion Valley following the course of Mono Creek. No physical evidence of the Mono Trail within the APE was found by the archaeological survey. Searching for evidence of the trail, the archaeologists evaluated aerial photographs and surveyed parts of the lake bottom during a reservoir draw down period.

In recent years, local Native Americans have held organized hikes along the modern recreational trail which skirts the west side of the lake (outside the project boundary). Native American gatherings are held at locations in the project vicinity and there is general recognition that the Mono Trail is an important part of the local Native American Heritage. A local Native American group, the Native Earth Foundation, with grant moneys provided by NPS, is conducting research to define a Mono Trail NRHP entity. A Mono Trail NRHP nomination might include archaeological sites like CA-FRE-115. Were CA-FRE-115 to become part of a Mono Trail Traditional Cultural Property, it would continue to be managed as an archaeological site in consultation with concerned local Native Americans. See also Native American Consultation (below).

Some members of the local Native American community attach importance to archaeological sites, particularly those containing human burials. No human remains have been discovered in the course of project investigations.

### **Native American Consultation**

The California Indian tribes that have been consulted about concerns related to the Vermilion Valley have been severely affected by the historical events of the last two centuries. Today they are represented by groups that fall into several different legal categories under Federal, State, and local law.

The North Fork Rancheria of Mono Indians of California, Big Sandy Rancheria, Cold Springs Rancheria, Bishop Paiute Tribe, Table Mountain Rancheria, and Picayune Chukchansi Rancheria are acknowledged by the U.S. Government as Indian Tribes.

The Dunlap Band of Mono Indians, and the North Fork Mono Tribe are not formally acknowledged as Indian tribes by the U.S. Government, but assert their historical legitimacy as California Indian tribes.

The Sierra Mono Museum, Mono Nation and the Native Earth Foundation are intertribal organizations that facilitate cooperation and collective action among several of the above groups, their members, and other California Indian individuals.

The monthly meetings of the Cultural Resource Work Group (CRWG) of the Big Creek ALP<sup>11</sup> have played a major role in exchanging information with the Big Creek area Native American community, Indian Tribes, and other groups about the Commission's relicensing process, general Native American concerns, concerns about resources in the project area, and concerns about studies conducted in support of the relicensing process. The discussion below relies on discussions which occurred in CRWG meetings for information about local Native American general attitudes and concerns about archaeological sites, archaeological investigation techniques, traditional cultural properties, and how SCE obtained the input of local Native Americans into project studies. The CRWG has met monthly since October, 2000. Commission staff regularly

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<sup>11</sup> On March 12, 2000, FERC authorized SCE to use the Alternative Licensing Process for four SCE projects within the upper San Joaquin watershed (Project Nos. 2175, 67, 120 and 2085, Big Creek Nos. 1 & 2, Big Creek Nos. 2A, 8, and Eastwood, Big Creek No. 3, and Mammoth).

attend. The more formally consultative component of these regular meetings includes written meeting advance notice to a mailing list of organizations (including tribes) and individuals. The notices include an agenda and a summary of the previous meeting.

On July 5, 2001, the Picayune Chukchansi Rancheria commented to the Commission on SCE's draft license application, primarily taking issue with the way the report on the year 2000 archaeological investigations described the Mono Trail. SCE responded in detail to the Picayune Chukchansi Rancheria's letter and included their response in the final license application.

SCE also included letters from Mono Nation dated February 22, 2001 and April 28, 2001 in the Final Application along with copies of its response to those letters. Mono Nation's criticism of the Vermilion Project focused on the way archaeological investigations were reported. Mono Nation's specific complaints include: the report does not address impacts to archaeological sites from original construction; the report evaluates impacts to individual sites instead of to the Vermilion Valley and Mono Trail as a whole; and the report does not indorse Mono Nation's assertion that the entire Vermilion Valley is a NRHP eligible Traditional Cultural Property.

In response to requests for government-to-government consultation from the Picayune Chukchansi Rancheria, and the North Fork Rancheria of Mono Indians, Commission staff held a meeting at the Forest Service's office in North Fork, California on January 8, 2002.

### **Agency Consultation**

Consultation with the SHPO for the Undertaking was initiated with a 20 February 2001 meeting at the California Office of Historic Preservation between SHPO staff, the applicant's representatives, and FS staff. The SHPO has commented on the SCE 2001 and 2002 archaeological reports (letters of July 10, 2001, and April 13, 2003). The SHPO concurred with: our recommended definition of the area of effect; that archaeological sites CA-FRE-115, CA-FRE-256/293, and CA-FRE-3186 meet NRHP eligibility requirements; and that continued operation of the project would be likely to adversely affect CA-FRE-115 and 3186. The SHPO requested additional information about CA-FRE-1939, CA-FRE-3175, and a locus of CA-FRE-115 labeled P1-Ver-2000-17. The SHPO deferred comment on project effects on the Mono Trail until completion of additional studies.

### **b. Environmental Effects**

### *Our Analysis*

The continued operation of the Vermilion Valley Project could affect archaeological sites eligible for listing in the NRHP. Table CR-1 summarizes information on the 9 sites identified in the APE and includes information on 3 nearby sites. We concur with the SHPO and SCE that sites CA-FRE-115 and CA-FRE-3186 are of NRHP significance and would be effected by continued operations of the reservoir. We agree with SCE that NRHP eligible CA-FRE-256/293 would not be effected by continued operation of the reservoir. The presumed path of the ancient Mono Trail beneath the water of Lake Edison would continue to be effected by the reservoir.

#### c. Unavoidable Adverse Effects:

Continued operation of the project would have minor effects on those sites affected by lake shore erosion and reservoir draw down.

#### d. Cumulative Effects:

The area's lakes, including Lake Edison, are an important part of what makes the area attractive to recreationists. Continued recreational use of the area, and the building of new recreational facilities, could add to existing effects on archeological sites (vandalism, erosion from foot traffic).

## **5. Recreational Resources**

### a. Affected Environment:

The Vermilion Valley Project is located within the boundaries of the Sierra National Forest (SNF) (Pineridge Ranger District and the High Sierra Recreation Area). Recreation areas within the region are concentrated in the SNF Pineridge Ranger District around Mono and Bear Diversions, Florence Lake, Huntington Lake, and Shaver Lake. Developed recreation facilities are primarily operated by private entities under special use permits issued by the FS. Florence Lake, Shaver Lake, and Huntington Lake are located approximately, 7 miles, 25 miles and 15 miles, from the project area, respectively and offer a variety of recreation opportunities, including camping, boating, picnicking, fishing, horseback riding, and various winter sports. The FS says that demand for recreation at developed sites within the SNF was 1.8 million recreation visitor days (RVDs) in 1995, and expects the demand to reach 1.9 and 2.1 million RVDs in 2005, and

2015, respectively.<sup>12</sup>

The project contains 2,202.27 acres of property within the current project boundary. In general, the boundary encompasses the Vermilion Valley dam, spillway, and associated structures; the project reservoir, the outlet works and channel from the dam to Mono Creek; Warm Creek diversion dam; the diversions channel from Warm Creek dam to the confluence with Boggy Meadow Creek; and Boggy Meadow Creek from the diversion channel to the reservoir.

The project area is accessed from State Route 168 and Primary Forest Route 80 (FS 80). FS 80 begins at State Route 168 near Huntington Lake and also provides access to the Kaiser Wilderness Area, the John Muir Wilderness Area, SNF campgrounds, Vermilion Valley and Mono Hot Springs resorts, and Florence Lake.

The project reservoir (Lake Edison) has a normal maximum surface area of 1,853 acres. The reservoir is 4.7 miles long and 1.3 miles wide at its widest point. Water from the Mono Creek watershed is stored in the reservoir from April to July and gradually released the rest of the year. During the fall/winter SCE draws the reservoir and it typically reaches its lowest level in March.

Recreation opportunities at Lake Edison include boating, fishing, sightseeing, hiking, and horseback riding. Due to the steep topography around much of Lake Edison, developed recreation facilities are located either on the western shore of Lake Edison or on the diverted reach of Mono Creek below the dam. Developed public facilities are operated by the FS, either directly or indirectly, and include Vermilion Campground, located on the northwest lake shoreline; Mono Creek Campground, located on the diverted reach about 1 mile below Vermilion Valley dam; Lake Edison Boat Launch, located near the western abutment of the dam; and Vista Point, an overlook located near the eastern terminus of the dam. Other FS operated public facilities in the immediate area include Mono Hot Springs Campground, Mono Creek Trailhead, and Mono Creek Picnic Area. Four trailheads are located in the project area, including Bear Creek Trailhead, Bear Ridge Trailhead, Mono Creek Trailhead, and Onion Springs Trailhead. These trails provide access to the Pacific Crest National Trail, the John Muir Trail, the John Muir Wilderness Area, or the Ansel Adams Wilderness Area.

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<sup>12</sup> A recreation visitor day or RVD represents 12 hours of recreation use and may consist of 12 people visiting for one hour, one person visiting for 12 hours, or any combination totaling 12 hours.

Private developed recreation facilities in the project area include the Vermilion Valley Resort, located on the western shore of Lake Edison; the High Sierra Pack Station; and the D&F Pack Station corrals. SCE does not maintain any recreation programs, measures, or facilities in the project area.

The FS uses the Recreation Opportunity Spectrum (ROS) to manage existing and future recreation opportunities in the SNF. The ROS identifies potential recreational uses of an area based on physical and social settings, and management objectives. Under this system, the FS classifies public lands within the project area as Semi-primitive Motorized and Roaded Natural. Semi-Primitive Motorized retains a predominately natural looking area with a low evidence of users and allows only resource modifications that are harmonious with the surroundings. Roaded Natural lands are natural looking areas with a moderate evidence of users. The existing project area is consistent with these two classifications.

The FS collected recreation use data for recreation facilities and activities in the project area from 1990 through 1994 and 1996 through 1999 (1995 data was not available). Based on this information, capacity and use data for specific recreation sites are as follows:

Table RC-1. Annual visitation and average occupancy rate at specific recreation sites in the project area from 1990-1994 and 1996-1999. (Source: SCE, 2001)

Facility	Annual Visitation Range (RVD)	Average % Occupancy Rate	
		Weekday	Weekend
Vermilion Campground	7,700 - 15,300	49%	78%
Mono Creek Campground	4,600 - 5,600	40%	40%
Mono Creek Picnic Area	None Provided	21%	40%
Lake Edison Boat Launch	None Provided	25%	48%

Dispersed camping opportunities in the project area can be found at Onion Springs Overflow and Mono Creek Overflow campgrounds. Dispersed camping also occurs near the Lake Edison Boat Launch, along the western shore of Lake Edison, and along part of Mono Creek. Some of these areas have been adversely effected by camping activities and

show signs of soil compaction, erosion, and undergrowth vegetation removal. Other dispersed recreation opportunities in the project area include swimming, picnicking, fishing, hunting, OHV use, and snowmobiling and Nordic skiing in the winter. Between 1993 and 1996, the average annual RVDs for hunting were 90,000.

Lake Edison provides fishing opportunities for several species of trout and both SCE and CDFG stock trout in the project area. FS surveys also show that the most popular fishing area in the project area is Lake Edison and that the vast majority of anglers are satisfied with the quality of their fishing experience. Other popular fishing areas include the diverted reach of Mono Creek below Vermilion Valley Dam and Cold Creek. The FS estimates that coldwater angling would increase 1-2 percent annually over the next fifty years and states that between 1993 and 1996 fishing RVDs were an average of 262,000 each year.

In addition, the FS reports that in 1996/1997, summer OHV use was a total of 108,500 RVDs. Further, the FS reports that winter sports at the SNF have gradually increased from 27,000 RVDs in 1987 and 26,000 RVDs in 1991 to 52,000 RVDs in 1996. The 16 mile-long Kaiser Pass Trail and seven mile-long Edison Lake Trail are two popular snowmobiling trails in the project area. Nordic skiers also use the Kaiser Pass Trail to access Lake Edison and Florence Lake. Very infrequently in the past, SCE has cleared Kaiser Pass Road of snow during the winter to allow access to project facilities for emergency work. On these rare occasions, snowmobiling on the Kaiser Pass Trail has been adversely affected. SCE has in the past, and proposes to continue in the future, to consult with the FS should it become necessary to clear Kaiser Pass Road.

Our review of the project's latest (2002) Licensed Hydropower Development Recreation Report (Form 80 Report) shows that the project had a total of 21,422 recreation days during the 2002 calendar year and that during that year the Lake Edison Boat Launch was only used to 25% of its capacity.<sup>13</sup>

SCE does not propose any additional recreation measures at this time. SCE will enter into negotiations with the FS in an effort to develop a mutually acceptable, recreation enhancement package for the project. The package would identify specific recreational enhancement(s) deemed necessary, a schedule for completing any required enhancement, and a way to identify cost-sharing mechanisms for carrying out any

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<sup>13</sup> A recreation day is defined as a visit by an individual to a project development for recreational purposes during a 24 hour period.

required enhancement measures. SCE says that such negotiations will begin in February 2003 and will be completed before the FS submits its Final 4(e) conditions.

b. Environmental Effects:

**Recommended Recreation Improvements**

SCE does not propose any additional recreation measures or improvements at this time.

In revised preliminary 4(e) condition 14 D., the FS would require that SCE construct specific recreation facilities or enhancements at existing recreation sites around Lake Edison. These include specific enhancements or additional facilities at Vermilion Campground, Edison Lake Boat Launch, and Vista Overlook. These enhancements and facilities include road and parking improvements, additional signage, campsite and boat launch improvements, and additional dispersed camping sites. The condition also identifies construction and funding responsibilities for these recreation sites.

At Vermilion campground, the FS's proposed improvements would provide camping opportunities to persons with disabilities, provide needed sanitary facility upgrades, address erosion and storm runoff problems, lower the risk of conflicts between bears and humans with regard to the proposed bear-proof improvements, and improve existing and future public use at the site.

The improvements FS would require at the Lake Edison boat launch site would provide accessibility to the site for persons with disabilities; address environmental damage caused by unauthorized, dispersed camping activities near the site; reduce the risk of conflicts between bears and humans with regard to the proposed bear-proof garbage bins; and improve the overall condition and usability of the existing boat launch ramp.

At Vista Overlook, the FS's condition would require access by disabled persons, provide need upgrades to the site's sanitary facilities, and enhance recreational use at the site. As part of its proposed improvements, the FS would require SCE to replace an existing rock monument at the site with rock pillars and the install interpretative signs.

*Our Analysis*

In its filing dated August 29, 2002, SCE states that it disagrees with parts of these FS measures (also described in the FS's original preliminary conditions). Item 13 of

condition No. 14 D requires SCE to construct additional campsites at the Vermilion Campground in the future, as necessary, based on certain use and capacity data. SCE says that the FS should be responsible for future campsites at the Vermilion campground, and that SCE should not be required to fund these improvements or, alternatively, should be allowed to collect user fees to fund the improvements.

The Vermilion campground, the Lake Edison boat launch, and the Vista Overlook are located within or adjacent to the current project boundary and directly relate to the recreation resources afforded by the project. Based on our review of available recreation use and capacity data for recreation sites and facilities in the project area, particularly FS data, it appears that the Vermilion campground, receives substantial use during the year, particularly on weekends during the summer recreation season. This information also suggests that recreation use and demand for recreation sites and facilities in the project area will increase in the future, as the populations of Fresno County and other nearby counties increase over time.

Other available information indicates that some recreation areas and facilities are in need of improvements or minor to moderate refurbishing to improve their overall condition and usability. In particular, the Vermilion campground and the Vista Overlook have outdated sanitary facilities that were built in the 1950s; the interior road within the Vermilion campground experiences erosion and storm runoff problems; and the Vermilion campground, the Lake Edison boat launch, and the Vista Overlook are not accessible to disabled persons.

In addition, the available information indicates that dispersed camping activities near the Lake Edison boat launch have resulted in erosion, soil compaction, and the destruction or removal of vegetation. In some cases these problems may adversely affect wildlife in the area.

Under SCE's current proposal (no new recreation improvements or measures), we expect that existing public recreation use of the recreation areas and facilities would continue, as well as the above problems and conditions. It is likely that over time the public's use and enjoyment of the existing recreation areas or facilities would diminish as public use of the project area grows in the future and the ongoing problems or conditions continue or worsen. Specifically, we expect that the condition and quality of the noted recreation facilities and areas will decline over time, as well as the condition of the natural environment affected by dispersed camping activities.

Based on our review of the available information, we think that additional

recreation improvements or measures at the Vermilion campground, Lake Edison boat launch, and the Vista Overlook could address the above problems and conditions and accommodate the expected increase in future public use of the project area. Further, in accordance with Commission policy, additional improvements for disabled persons at these sites would ensure that these persons have adequate access and use of the project's recreation resources.

Under its revised preliminary condition 14 D, the FS's proposed recreation improvements and measures would address the problems or conditions noted above and some would further enhance or improve recreation sites in the project area. Though this is the case, some of the proposed improvements do not appear needed at this time or the FS has not provided sufficient supporting information for a particular proposed improvement, or both. We examine this issue in more detail as part of our recommendations for recreation in the Comprehensive Development section.

We consider the cost of the recreational measures FS would require in the developmental resources section and make our recommendations in the Comprehensive development section.

### **Recreation Management**

FS revised preliminary Section 4(e) condition No. 14 A would require SCE to conduct a recreation survey and prepare a report once every six years to identify changes in the recreation uses and activities in the project area. Condition No. 14 B requires SCE to prepare and file a recreation plan to address recreation resource management and development at the project, within 1 year following the issuance of a new project license. Finally, condition No. 14 C requires SCE to provide specific annual contributions to the FS for monitoring and permit compliance related to a FS concessionaire special use permit, and for various maintenance, site policing, and enforcement activities at the project.

#### *Our Analysis*

As previously noted, the project area receives a substantial amount of public recreational use and there is a need for some improvements to recreation facilities and sites in the area. Section 2.7 of the Commission's regulations outlines a project licensee's responsibilities regarding the management and development of a hydropower project's

recreation resources. In particular, section 2.7 requires, in part, licensees to develop suitable public recreation facilities and public access on project lands and waters and to cooperate with appropriate agencies and interested entities in the preparation and implementation of plans to construct, operate, and maintain project recreation facilities and areas. The required recreation plan and recreation surveys would ensure that suitable recreation development and adequate public access are provided at the project and that SCE meets its obligations under section 2.7 of the Commission's regulations. Further, such recreation plans typically contain, among other things, provisions to periodically monitor recreation use at the project and to assess the adequacy of project recreation facilities to meet the needs of the area. The information FS would require under condition 14 A represents such monitoring provisions.

In its filing dated August 29, 2002, SCE states that it disagrees with parts of these FS measures, as previously described in the FS's original preliminary conditions. SCE also says that the recreation improvements in condition No. 14 D should only apply to project-related recreation facilities within the project boundary and not other recreation facilities in the project area. Finally, SCE states that it should not be required to provide funding for FS oversight of its concessionaire special use permit, as required under condition No. 14 C, noting that concessionaires already benefit from user fees and should pay the costs of monitoring, maintenance, and repair of the facilities.

In accordance with Commission policy, the project recreation plan should pertain only to the recreational resources afforded by the project and those recreation facilities and areas related to the project's recreation resources, such as the Vermilion Campground, the Lake Edison Boat Launch site, and the Vista Overlook. Further, although the FS owns the existing project-related recreation facilities, SCE has an obligation under any license issued for the project to work with the FS to ensure that such facilities are adequately operated and maintained to meet the existing and future public recreation needs of the project. Under the Commission's regulations, the project licensee and operators of project recreation facilities within the project boundary may charge reasonable user fees in order to help defray the costs of operating, maintaining, and constructing such facilities. Thus, concessionaires are allowed, under the Commission's regulations, to charge reasonable fees necessary to help defray the cost of construction, operation, and maintenance of project-related facilities. We question, however, the need for SCE to share costs associated with the FS's oversight of its concessionaire special use permit. We examine this issue further in the comprehensive development section along with our final recommendations.

In conclusion, staff finds that implementation of FS conditions 14. A, B, and C

would ensure that SCE meets its obligations under Section 2.7 of the regulations and would ensure that the project's recreation facilities and resources are constructed, operated, and maintained in a manner that meets the needs of the public throughout the license term.

### **Recreational Fishery Management**

In its letter filed June 10, 2002, CDFG says that its primary management objective for Lake Edison is a "put and grow" fishery and that it plants fingerling-sized rainbow trout in Lake Edison. Mono Creek is managed as a "put and take" fishery and CDFG plants 11-14 inch rainbow trout in Mono Creek. CDFG says that given this management objective and to offset the effects of annual/seasonal reservoir draw-downs and project related instream flow reductions, it recommends that any license issued for the project require SCE to contribute a reasonable portion (50 %) of the costs of fish production that is needed to sustain a fishery in Lake Edison and Mono Creek. Currently, SCE maintains a trout rearing facility and a voluntary stocking program. SCE proposes to continue its voluntary fish stocking program and states that funding should not be required as part of any new license that may be issued for the project.

#### *Our Analysis*

As noted in the Aquatic Resources section, the fishery in Lake Edison and Mono Creek is in good condition under current operations. Between 1994 and 2000, CDFG has stocked between 20,246 and 95,250 trout per year. Fishing stocking in Lake Edison and in Mono Creek provides important recreational fishing opportunities in the project area and represents one of the public benefits of the project. Fishing activities are popular throughout the project area, including on the shores and mid-lake of Lake Edison and the diverted reach of Mono Creek below Vermilion Valley Dam. FS surveys conducted in 2000 indicate that the most popular fishing area in the project area is Lake Edison and that the vast majority of anglers were return visitors to the area and rated the quality of their fishing experience as good to excellent. Often, the anglers caught both rainbow and brown trout and appreciated the scenic, peaceful setting of the area.

### **Emergency Snow Removal from Kaiser Pass Road**

On rare occasions, it has been necessary for SCE to clear Kaiser Pass Road of snow during the winter to access project facilities for emergency work. It appears that this emergency work requires the road to be closed at times. During such periods, snowmobile use of the Kaiser Pass Trail, which occupies the road under normal

conditions, is adversely affected. SCE has in the past and plans to continue to consult with the FS should it become necessary to clear Kaiser Pass Road.

### *Our Analysis*

By letter dated September 4, 2002, the National Park Service recommends SCE develop a maintenance protocol and/or mitigate for the effects of the emergency closure on snowmobiling on Kaiser Pass Trail.

Snowmobile use in the project area is very popular and Kaiser Pass Trail is a commonly used trail. Although it appears that snowmobiling is only affected infrequently by SCE's emergency work, it is unclear to what extent snowmobile use of the trail is adversely affected and whether or not these affects can be reduced or possibly mitigated. In any license issued for the project, SCE has an obligation to operate and maintain project works and facilities in a safe and efficient manner, and to provide for reasonable public access and use of the project for recreational purposes.

### **Project Boundaries**

In its application, SCE propose two minor changes to the existing project boundary. Specifically, SCE proposes to remove from the boundary a portion of FS 80 located between the Vermilion Valley dam area and a point near the Mono Creek Campground. Staff estimates that this section of road is approximately one mile in length. Currently, the boundary follows the outside edge of the road on both sides between the above two areas. SCE states that this portion of the road was improperly included in the boundary under the current license and that the road is maintained by the FS, does not contain any project facilities or features; and is primarily used by the public for recreation access, including access wilderness areas outside the project area. A portion of the road, located in the immediate area of the Vermilion Valley dam, would remain in the project boundary. This area includes various spur roads to access project works below the dam, the Vista Overlook area, and the Bear Ridge Trailhead.

In addition, SCE proposes to add the Warm Creek Diversion dam access road to the project boundary. This 720 foot-long, spur road is used by SCE to access the diversion facilities for maintenance and is closed to the public. The road starts at the Onion Springs Road and ends at the diversion. The boundary would run along either side of the road between these two points.

### *Our Analysis*

Project boundaries are used to designate the geographic extent of the lands, waters, works, and facilities that the license identifies as comprising the licensed project. In particular, lands enclosed by the boundary must include those necessary for the operation and maintenance of the project, as well as, those lands necessary for other project purposes.

Based on our review of the available information, it appears that the portion of FS 80 proposed for removal from the boundary does not provide direct access to specific project works or project facilities other than Vermilion Valley dam area. SCE proposes to retain within the project boundary, a short section of FS 80 in the immediate area of the dam. Further, as noted above, FS 80 provides access to a variety of recreation areas and, its use for the project appears to be very limited. The portion of the road to be removed from the boundary does not appear to be necessary for the operation, and maintenance of project facilities and other project purposes, such as public use of the project's recreation resources. The public's use of the road is not expected to change as a result of the proposed project boundary modification. Given this information, we agree with SCE that the removal of the noted portion of FS 80 from the project boundary is appropriate.

In addition, we concur with the proposed inclusion of the access road to the Warm Creek diversion dam within the project boundary. The access road is currently used by SCE to access project works and we find that it is necessary for the operation and maintenance of the project. In accordance with Commission policy, the road should be included in the project boundary for any license issued for the project.

### **Project Access Roads**

As previously noted, the project area is accessed from State Route 168 and FS 80 (a.k.a. Kaiser Pass road). FS 80 begins at State Route 168 near Huntington Lake and also provides access to the Kaiser Wilderness Area, the John Muir Wilderness Area, SNF campgrounds, including the Mono Creek Campground and Picnic Area, Vermilion Valley and Mono Hot Springs resorts, and Florence Lake. Specifically, an unimproved road extends from the end of FS 80 at the Vermilion Valley dam to the Vermilion Valley resort and becomes an off-highway vehicle road (Onion Springs Road) from the resort to Margaret Lakes trail, located about 4.5 miles northwest of the resort. Several dirt roads in the area provide access from the Vermilion Valley dam to various project works, including Warm Creek Diversion Dam. With the exception of the Warm Creek Diversion Dam access road, all the above roads are open to the public and are primarily located outside the project boundary. SCE uses these roads to access various project works and

facilities for operation and maintenance purposes.

In its revised preliminary conditions, the FS includes several conditions related to the use and maintenance of roads in the project area. In particular, condition No. 15 A requires SCE to prepare a Transportation System Management Plan for the protection and maintenance of roads associated with the new license. The condition also requires SCE to implement appropriate erosion control measures associated with these roads. In its comments on the original preliminary condition 13 (now revised preliminary condition 15 A), SCE states that project access roads should be limited to roads within project boundaries. Further, SCE states that any roads that are open to the public should be removed from the project boundary and SCE should not be responsible for the cost of road maintenance, except that portion of incremental maintenance due to SCE's use.

Revised preliminary condition No. 15 B requires, in part, SCE to implement specific public safety and erosion control projects in the area, including contributions to the reconstruction and stabilization of a portion of the Onion Springs road; and contributions to the reconstruction and/or stabilization of Kaiser Pass road from the San Joaquin River to the Vista Overlook. SCE contributions to these specific projects are based on a commensurate share of project-induced traffic.

In its comments on the original preliminary condition (condition No. 13), which is similar to the revised condition No. 15 B, SCE states that it should not be responsible for any of the above projects that involve public roads, except for a percentage of any additional damage to the roads caused by SCE's operation and maintenance activities. Further, SCE states that these projects should not be required under the project license as they are located outside the project boundary; and that any SCE responsibilities in this regard could be handled under separate authority from the FS to SCE. Finally, SCE contends that the FS should be solely responsible for general public safety and erosion control work envisioned on Kaiser Pass Road and Onion Springs Road.

Revised preliminary condition No.15 C gives the FS unrestricted access to roads within the project area and gives the FS the right to extend these road access rights to others, including the public. In its comments on this preliminary condition, SCE states that the FS's right to extend access rights to others should not include roads where a safety hazard is present.

#### *Our Analysis*

Revised preliminary condition No.15 A places certain responsibilities on SCE for

the operation and maintenance of roads associated with the project license. While implementation of the Transportation System Management Plan would ensure that roads in the project area are adequately operated and maintained in a manner that protects the public and prevents or minimizes erosion damage, we do not believe that SCE should be largely responsible for these roads given that SCE shares the use of these roads with others who use them to access non-project related recreation areas.

Based on our review of the available information, it appears that SCE primarily uses FS public roads to access project facilities and works for operation and maintenance purposes and that these same roads are used by the FS and others, including the public, to, among other things, access recreation areas and trails unrelated to project recreation resources. Although most of these roads appear to be located outside the project boundary, they are used, in part, by SCE for project operations. As such, it would be appropriate for SCE to contribute, in part, to the operation and maintenance of these roads, equivalent to its use of these roads. The details regarding the type, level, and nature of SCE's contribution to road operation and maintenance should be determined as part of the preparation of the Transportation System Management Plan.

Revised preliminary condition No. 15 B requires, in part, SCE to implement specific road improvement projects. It is clear that implementation of these specific projects would improve road conditions in the area and provide enhance public use of these roads and reduce erosion impacts associated with this usage. However, as we noted above, SCE should not be fully responsible for operation and maintenance of these roads and should share in these responsibilities, equivalent to its use of the roads. In this regard, SCE not be fully responsible for the identified road improvement projects, but only a portion of the projects, equivalent to SCE's use of the identified roads for project purposes. The details regarding SCE's specific involvement with these road improvement projects should be determined as part of the preparation of the Transportation System Management Plan.

Regarding revised preliminary condition No. 15 C, SCE is concerned that the FS reservation to allow the public use of roads in the area may include roads that it may consider to be a public safety hazard. In accordance with Commission regulations, a licensee has specific public safety responsibilities regarding its licensed project, and, under certain standard license conditions, it has the authority to preclude public access to project facilities, waters, and lands, as necessary for the protection of life, health, or property. In this regard, we would expect that appropriate safety measures would be implemented at the project, including prohibiting public access to certain areas if necessary, in order to protect the public and ensure safe project operations.

c. Unavoidable Adverse Effects:

The construction and/or maintenance of any future recreational enhancements or road improvements that result in ground-disturbing activities would result in some minor erosion, vegetation removal, and/or sedimentation.

d. Cumulative Effects on Recreation:

Any recreation improvements or enhancement measures implemented at the project should enhance recreational use at the project and have a beneficial cumulative effect on recreational resources within the project area and river basin. Further, such improvements or enhancements would likely compliment the management objectives of the FS's Forest Land and Resource Management Plan for the Sierra National Forest.

In addition, the Vermilion Valley Project operates along with six other hydropower projects within SCE's Big Creek Hydro System. The existing licenses for these projects expire between 1999 and 2009. In recent years, SCE initiated a multi-year collaborative process for the relicensing of four of its seven hydropower projects. The remaining three projects, including Vermilion Valley, are engaged in individual relicensing processes. As part of the collaborative process, several recreation studies have been undertaken regarding existing recreation facilities and uses and overall future recreational needs for the Big Creek Hydro System. The results of these studies and any subsequent determination of future recreational needs/plans for the Big Creek Hydro System may affect future recreational development at the Vermilion Valley Project.

**6. Aesthetic Resources**

a. Affected Environment:

The project is located on the western slopes of the Sierra Nevada Mountains. Lake Edison is surrounded by steep, rugged mountains covered by coniferous forests (Jeffery Pine, white fir, and lodgepole). The tree canopy is broken by outcrops of light-colored granite, occasional small meadows, small streams, and Lake Edison. The area is predominately a natural landscape and Lake Edison is the dominant aesthetic resource. There is also evidence of human activity in the area, such as recreational use, boat and automobile use, and some shoreline development, particularly along the southern and western areas of Lake Edison.

The FS uses the Scenic Management System (SMS) to analyze the visual impacts of the project. This system provides a mechanism for inventory and analysis of landscape resources and the effects of land management activities on those resources. In doing so, the SMS considers the landscape character, visual sensitivity, scenic attractiveness, landscape visibility, and scenic integrity of the area.

Landscape character describes specific landscape attributes that exist in the area. Visual sensitivity is based on the landscape being viewed and the viewer's attitude toward the maintenance of the landscape. Scenic attractiveness measures the landscapes' variety and uniqueness. Landscape visibility describes elements that influence the landscape's importance and sensitivity (i.e. viewing distance, public interest, etc.). Finally, scenic integrity describes the degree of intactness and wholeness of the landscape character.

The project area is considered to have a scenic attractiveness ranging from typical (foreground along the Lake Edison shoreline) to distinctive (background lands surrounding the project area). Viewers involved in recreational activities on the lake and at developed recreation areas are considered to be moderately visually sensitive, while viewers involved in horseback riding and hiking on trails near wilderness areas are considered to be highly visually sensitive. Under the SMS, the FS uses visual quality objectives (VQO) to describe how it wants the forest to look in the future. Regarding the project area, the FS identifies the VQO as retention and the surrounding area as preservation. Under the retention objective, management activities are to remain unnoticed and be compatible with and visually subordinate to the characteristic landscape; and under the preservation objective, management activities are to be ecological and keep the existing landscape character intact.

#### b. Environmental Effects:

In its application, SCE describes the visual compatibility of project facilities with the existing landscape based on its evaluation of the effects of such facilities on the VQO of the project area. SCE determined that the visual contrast and landscape visibility of Vermilion Valley dam, spillway, and gaging station ranges from low (i.e. views on or near the lake) to high (i.e. views from vista point), depending upon the viewers location. SCE finds these project facilities inconsistent with the retention VQO. Regarding Lake Edison and the Warm Creek diversion, SCE also finds that these facilities inconsistent with the retention VQO. However, SCE notes that Lake Edison enhances the scenic quality and recreational experiences of the area and that Warm Creek diversion has a low

visibility and is largely inaccessible making its visual effect minimal. Given this information, SCE finds that while the project is inconsistent with the retention VQO, its visual effects are insignificant.

In its application, SCE states that it will continue to maintain project facilities in a manner that minimizes conflicts with the surrounding land uses and management practices and that it does not propose any specific measures related to the project's effects on aesthetic resources.

### **Visual Resource Plan**

In its revised preliminary condition No.16 B, the FS would require that SCE develop a visual resources plan for the protection and rehabilitation of National Forest System visual resources affected by the project. The plan is to include an evaluation of various project features and facilities, proposed mitigation measures, and an implementation schedule to bring the facilities into compliance with applicable FS visual resource standards and guidelines.

#### *Our Analysis*

Based on our review of the available information, we concur with SCE's assessment of the project's visual effects. As noted above, the project does not have a significant adverse visual effect on the surrounding area. In this regard, we believe the required visual resources plan would not significantly reduce the existing visual effects of the project. However, implementation of the plan could ensure that future project-related activities, such as new or modified facilities are implemented in a manner that minimizes adverse impacts on the visual quality of the project area.

## **VI. DEVELOPMENTAL ANALYSIS**

The Vermilion Valley Project has no power generating facilities. SCE operates the storage of Lake Edison as part of its overall operation of the Big Creek Project. Therefore, in this section, we show the cost of the environmental measures we discuss in this EA and estimate the cost of operating both the proposed Vermilion Valley Project and the project with the measures staff recommends.

The existing project represents the no-action alternative. Under this alternative, there would be no change in current operation or facilities. The project would continue to operate as it now does. No enhancement measures would be provided, and the existing environment would not change. Because there is no enhancement under this alternative, there are no associated added costs. The annual cost of the existing project is about \$703,000. SCE proposes measures that would increase the annual operating cost by \$21,840, for a total operating cost of \$724,840.

### Costs of Environmental Measures

In table DR-1, we estimate the cost of the protection, mitigation, and enhancements measures proposed by FS, CDFG and Commission staff. With an annual cost of \$110,400, one measure would significantly increase the operating cost of the project: FS's recreational improvements.

Two of the proposed measures that would decrease the value of the project's storage to SCE's downstream power projects are raising instream flow in Mono Creek and releasing seasonal high flows for channel maintenance to Warm Creek. During certain reservoir level and inflow conditions at both Vermilion Valley Reservoir and Florence Reservoir, the instream flow FS would require could force SCE to pass flow into the South Fork San Joaquin River instead of into the Mono Creek Diversion if flows from these reservoirs exceed the capacity of Ward Tunnel. Flows diverted into the South Fork San Joaquin River produce power at only two powerhouses located downstream (Mammoth Pool and Big Creek No. 4), or one (Big Creek No. 4) when Mammoth Pool Project is spilling, whereas flow that passes into the Mono Creek Diversion is available for power production in several of the powerhouses in the Big Creek system. Therefore, under these conditions SCE's ability to maximize energy production from this water would be limited.

Our estimates for recreational enhancements are based on FS estimates. With the recreational measures we recommend, the staff recommended measures would have a total cost to SCE of \$147,355, for a total annual operating cost of \$850,355.

*Table DR-1. Summary of the estimated annual cost of protection, mitigation and enhancement measures proposed for the Vermilion Valley Project (Source: staff)*

Proposed Measures	Capital cost of measures	O&M Cost	Levelized Annual Capital and O&M cost

		(2003 \$)
Minimum lake level (Proposed by CDFG)		\$75,000
Recreation Plan	\$15,000	\$1,500
Instream flow monitoring plan	\$20,000	\$1,500
Iron and Manganese monitoring plan	\$30,000- \$75,000	\$5,140
Fish monitoring	\$10,000 each (4 times)	\$1,840
Fish stocking	\$2,000	\$2,000
FS recreational improvements	\$1,520,000	\$110,400
Staff recreational improvements	\$1,370,000	\$99,500
Eagle Protection Plan	\$15,000	\$1,500
Visual Resources Plan	\$15,000	\$1,500
Raise Mono Creek instream flow		\$9,875
Warm Creek channel maintenance flows		\$7,800
Complete and implement a HPMP	\$200,000	\$13,700
Transportation system management plan	\$15,000	\$1,500

## VII. COMPREHENSIVE DEVELOPMENT

Sections 4(e) and 10(a) of the FPA require the Commission to give equal consideration to all uses of the waterway on which the project is located. When reviewing a hydropower project, we consider the water quality, fish and wildlife, recreational, and other non-developmental values of the involved waterway equally with its electric power and other developmental values. Accordingly, any license issued shall

be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

This section contains the basis for, and a summary of, our recommendations to the Commission for the relicensing of the Vermilion Valley Project.

### **A. Recommended Alternative**

Based on our independent review and evaluation of SCE's proposed project, SCE's proposed project with our additional staff-recommended environmental measures (staff alternative), and the no-action alternative, we select the staff alternative as the preferred alternative.

We recommend this alternative because: (1) issuance of a new license would allow SCE to continue to operate the project as a dependable source of storage to use in its Big Creek Power system to generate electric power for its customers; (2) the electric power generated from the water stored at Vermilion avoids the need for an equal amount of fossil fuel-fired electric generation and capacity, continuing to help conserve these nonrenewable energy resources while reducing atmospheric pollution; and (3) the recommended environmental protection and enhancement measures would improve water quality, protect fish and terrestrial resources, improve public use of recreation facilities and resources, improve aesthetics, and maintain and protect historic and archaeological resources within the area affected by operation of the project.

SCE proposes and we agree that the following environmental measures should be included in any license issued by the Commission for the Vermilion Valley Project:

- Consult with the appropriate agencies and, if needed, design and implement erosion control measures in the Warm Creek diversion channel.
- Continue releasing a year-round minimum flow of 0.2 cfs or natural flow, whichever is less, downstream of the Warm Creek diversion dam.
- Continue stocking rainbow trout from its own trout-rearing facility in consultation with the California Department of Fish and Game to support recreational fishing in the project area.
- Take more water quality samples in Mono Creek to evaluate potential sources

of increases in iron levels and assess any biological effects of this mineral. If further sampling and analysis determines that the Vermilion Valley Dam represents a point source of iron, SCE will work with the Regional Water Quality Review Board to determine if SCE's operations can be altered to reduce the discharge of iron, or if a National Pollutant Discharge Elimination System permit is required.

- Develop a mitigation and monitoring plan and treat the Vermilion Valley dam face in cooperation with the Sierra National Forest to control cheat grass, bull thistle, and woolly mullein in this area<sup>14</sup>.
- Consult with the FS on snow clearing activities on Kaiser Pass Road for emergency access to project works.
- Develop a Vermilion Valley Project HPMP.
- Remove the improved road between Vermilion Valley Dam and the Mono Creek Campground from the project boundary.

In addition, we recommend including the following measures in any license issued for the Vermilion Valley Project:

- Provide a 7-day average release of 25 cfs to Mono Creek, from September 15<sup>th</sup> through December 15<sup>th</sup>, with instantaneous flows no lower than 20 cfs. From December 16<sup>th</sup> to April 30<sup>th</sup>, provide a 7-day average release of 18 cfs, with instantaneous flows no lower than 15 cfs. And, from May 1<sup>st</sup> through September 14<sup>th</sup>, provide a 7-day average flow release of 20 cfs, with instantaneous flows no lower than 16 cfs.
- Monitor fish populations in the fifth, sixth, tenth and eleventh years of the new

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<sup>14</sup> Noxious weeds can displace native plants and decrease wildlife habitat value. Three invasive weed species were identified in the project area during 2000 surveys. SCE's proposed measures would control the spread of noxious weed on project lands and would be required by FS preliminary condition 17.

license term.

- Develop and implement recreational enhancement measures at the Vermilion Valley Campground, the Lake Edison Boat Launch site, and the Vista Overlook.
- To provide high flow releases for channel maintenance, continue releasing flow from Warm Creek Diversion dam to the natural channel during wet years until July 1<sup>st</sup>.
- To provide high flow releases for channel maintenance, release from Vermilion Valley dam to lower Mono Creek a variable flow that includes a release of 450 cfs for two consecutive days.
- Provide funds for trout stocking in project stream reaches.
- Expand water quality monitoring plan to examine both iron and manganese levels coming from Lake Edison dam leakage.
- Develop and implement a recreation plan that includes provisions to implement the staff recommended recreation facility enhancements; to develop suitable recreation facilities and public access to project recreation resources; to monitor recreation use and public needs, and the adequacy of project recreation facilities to meet such needs; and to share in the cost of constructing, operating, and maintaining project related recreation facilities and areas.
- Develop and implement a visual resources plan.
- Implement an erosion control plan.
- Develop an eagle management plan.
- Develop and implement an instream flow monitoring plan.
- Develop a transportation system management plan.

## **B. Discussion**

The following is a discussion of the basis for some of our recommended measures.

## **1. Water Resources**

### **Flow Measurement**

To ensure documentation of compliance with the flow requirements of any new license issues, we recommend that SCE, within 12 months of license issuance, develop an instream flow monitoring plan for Mono and Warm Creek in consultation with the FS, SWRCB, CDFG, and USGS. The plan should meet the requirements outlined in preliminary Section 4(e) condition 12 B.

We are not recommending year-round operation of the gage below the diversion dam on Warm creek because climatic conditions and very low flows would most likely make year around operation of the gage infeasible.

We estimate that to develop the plan would cost SCE \$1,500 annually.

### **Iron and Manganese Monitoring**

Due to the concerns regarding reductions in biomass and species diversity raised in 1986, and current observed exceedance of water quality standards in 2001, we recommend that SCE develop a plan for further examining iron and manganese levels coming from Lake Edison dam leakage. This plan should include development of a program for further monitoring at a variety of dam outflows and leakage flows, as well as an evaluation of the potential sources of the elevated levels of iron and manganese. The plan should also specify the nature of any targeted biotic monitoring that would enable an assessment of the potential effects on the aquatic community.

Besides recommending a course of action, SCE should discuss of similar situations and potential solutions, including conceptual costs associated with alternative measures. This plan, which could cost SCE about \$5,000 annually, should be developed in consultation with the SWRCB and FS.

If the results of this study show that iron and manganese levels cannot be easily reduced, SCE has already noted that they would file for a NPDES permit for the discharge of iron. Placing dam leakage outflows under an NPDES permit would cover the concerns raised by the FS regarding water pollution mitigation.

## **Sediment and Erosion Monitoring**

Because of the potential for continued erosion along the Warm Creek Diversion Channel, we recommend SCE develop an erosion control plan incorporating the measures SCE proposes to implement to reduce erosion and subsequent sedimentation. We recommend that SCE consult with the appropriate agencies and, to the extent necessary, design and implement the necessary erosion control measures.

In addition to SCE's proposed measures, the plan should include the provisions of FS Section 4(e) condition 12 F.

## **2. Aquatic Resources**

### **Raising Instream Flow to the Lower Mono Creek Bypassed Reach**

SCE proposes to continue its minimum flow release of 10 cfs from the Vermilion Valley dam to lower Mono Creek. It says that there have been no identified effects of project operations on the fish community in lower Mono Creek and this stream supports a self-sustaining brown trout population that is in good condition under the current flow regime. The preliminary FS 4(e) condition 12 A would require that Edison release a 7-day average flow of 25 cfs from the Vermilion Valley dam to lower Mono Creek during the time that trout spawning is likely to occur (September 15<sup>th</sup> through December 15<sup>th</sup>) and 7-day average flows of 18 or 20 cfs for the rest of the year.

In the aquatic resources section, we consider the condition of the trout population in Mono Creek and how flow releases affect available habitat. We agree with SCE that the existing brown trout population in lower Mono Creek is in good condition, but note that the existing flows that have sustained this viable, self-sustaining brown trout fishery are nearly always well above the current minimum flow of 10 cfs.

We also considered what instream flow would be needed to establish a wild rainbow trout population in lower Mono Creek, as SWRCB recommends, and how setting this flow would affect recreation and power resources. CDFG management objectives for this stream include adult rainbow trout stocking but do not include managing flows to promote rainbow trout spawning. We conclude that without such a stated flow objective, which would be at the expense of the wild brown trout population, it is premature to consider a minimum flow of at least 100 cfs that would be required to protect spawning. Minimum flows of this size would most likely result in a drawdown of Lake Edison

during the recreation season, and curtailment of SCE's ability to meet peak energy demands during the summer.

We recognize that stocking adult trout to support a put and take fishery does not necessarily support a goal of establishing a viable spawning population in a stream as SWRCB desires; different trout (i.e., sexually mature brood stock), most likely stocked at different times (i.e., during the fall, when angling pressure is diminished), would better support this objective. We note that CDFG's stated management objective for this reach is to support a put and take fishery.

Though higher instream flows could benefit the fishery, raising the existing instream flow in Mono Creek could affect the power value of the releases from the Vermilion Valley Project. As we've said in the Developmental Section, depending on reservoir level and inflow conditions, these measures could force SCE to pass flow into the South Fork San Joaquin River instead of into the Mono Creek Diversion, limiting SCE's ability to maximize energy production from this water. We estimate the cost of meeting the higher instream flow to be about \$9,875 annually.

We think enhancing the fishery would justify some loss in downstream power benefits from the project's storage. We therefore recommend, in accordance with the FS minimum flow recommendation, that SCE release minimum flows that correspond to preliminary Section 4(e) condition 12 A (see appendix B). We encourage SCE to attempt to maintain flows as close to 20 cfs as possible during June, July, and August, to extend optimal fry conditions for as long as possible.

### **Monitor Fish Populations**

SCE doesn't propose to conduct fish surveys to monitor the condition of native fish and rainbow trout population in Vermilion Valley. FS preliminary Section 4(e) condition 12 F would require SCE to conduct fish surveys to assess the health of the existing and future fish populations every 10 years in Lake Edison, lower Mono Creek, Warm Creek and Boggy Meadow Creek.

As we stated in Section V, monitoring fish populations would allow a determination of the response of fishes to any changes the Commission prescribes in a new license. The FS condition, however, would not allow for timely identification of major fish population shifts under any new flow regime. Therefore, we recommend this monitoring be done in the fifth, sixth, tenth and eleventh years. Sampling after the first 5 years would allow the fish populations to adjust to the new conditions and sampling

during two consecutive years would provide for a better estimate of population parameters than a single year's sampling. We expect that any fish population shifts that would result from the altered flow regimes to be evident by the conclusion of monitoring during the eleventh year from license issuance, and unless warranted by previous monitoring results, do not recommend monitoring beyond this time. We recommend that SCE develop, in consultation with the FS and CDFG, and implement a fish monitoring plan. We estimate that the fish surveys would reduce the net annual benefit of the Vermilion Valley Project by about \$1,840. We think the added cost is reasonable to determine the effects of any proposed measures on fishery resources.

### **Developing Seasonal High Flows Mono and Warm Creek**

#### Mono Creek

SCE does not propose any seasonal high flow releases to lower Mono Creek for flushing and channel maintenance purposes. In the aquatic resources section, we discuss FS's preliminary Section 4(e) Condition 12 D that SCE release from the Vermilion Valley dam to lower Mono Creek a variable channel maintenance flow that includes a release of 450 cfs for two consecutive days.

SCE estimates that bankfull discharge in lower Mono Creek is between 335 and 468 cfs. In its analysis of channel maintenance and riparian flow analysis for the Vermilion Valley Project, dated August 30, 2002, the FS agrees with SCE that current bankfull flows are in the range of 450 cfs and that the existing channel morphology has adjusted to these flows. Under current conditions, flows that exceed bankfull conditions for at least seven days in duration occur on an annual basis. Consequently, in Section V we conclude that fines would be flushed from spawning gravel, and spawning gravel would be redistributed under current conditions.

Since FS preliminary Section 4(e) condition 12 D would require releases similar to those SCE makes under current operations, we estimate that providing the channel maintenance flows wouldn't reduce the annual benefits of the project's storage to downstream power plants during most water year types. However, when dry or critically dry years occur back to back, SCE may not be able to meet condition 12 D as it is now written. Therefore, while we recommend the development and implementation of a channel maintenance flow for Mono Creek, we do not recommend FS condition 12 D unless FS modifies the condition to provide for the occurrence of multiple dry years.

#### Warm Creek

SCE now releases water to the capacity of a 6-inch pipe through the Warm Creek diversion dam for a period of 72-hours on, or about, May 1 of each year. No changes are proposed. Based on the maximum expected head at this pipe, we estimate that this equates to a release of about 0.5 cfs. Based on our analysis, this flow does not serve either channel maintenance purposes or to flush fine-grained particles from areas that may be suitable for trout spawning. However, that does not necessarily mean that flows that would serve this function do not occur. As noted in our discussion of Warm Creek in section V.C.1, undocumented channel maintenance and flushing flows may already be occurring during many years.

In preliminary section 4(e) condition 12 D, the FS would require that SCE continue releasing flow to the natural channel during wet years until July 1<sup>st</sup>. After reviewing the hydrologic records for the past 30 years (from 1974 to 2003), FS estimates that wet year water types have occurred 40 percent of the time, based on the San Joaquin Rivers Index. With the high discharges and long durations of these wet year flows, FS concludes that such flows would be high enough to meet FS objectives for improving aquatic habitat in Warm Creek. We agree that such flows should be able to mobilize and transport spawning gravel and provide overbank flows that would serve to maintain floodplain and riparian habitat.

In the developmental resources section, we estimate that providing the channel maintenance flows that FS would require in Warm Creek during these wet years would reduce the annual benefits of the project's storage to downstream power plants by about \$7,800 annually.

We recommend that SCE make the riparian releases condition 12 D would require.

### **Minimum Reservoir Level in Edison Lake**

CDFG recommends that SCE be required to maintain a minimum pool elevation during critically dry, dry, below normal, normal, and above normal water years. CDFG appears to base this recommendation on a statement that SCE made in the draft license application that suggests that in drier years spatial habitat in the project area may be limiting to fish populations.

As we've said in the Aquatic Resources section, we are unaware of any evidence that the current drawdown regime is adversely influencing trout populations and do not think that habitat is limiting for fish that overwinter in Lake Edison during the time when

the lake would be drawn down.

In addition, CDWR typically does not have information to reliably determine the water year-type for the subsequent year until early spring, after the minimum lake level would have already been achieved. We conclude that there is no evidence that specification of minimum pool levels of Lake Edison by water year type is needed. Implementation of such a measure would be problematic since the water year type is not completely determined until after the minimum pool is reached and the measure could significantly affect the existing power value of the project—reducing the annual value by as much as \$50,000 to \$75,000.

### **Ramping of Mono Creek Flows**

In the current license, SCE is not required to follow a ramp rate for releases into Mono Creek and SCE does not propose a ramp rate be developed. Preliminary section 4(e) condition 12 C would require SCE to develop a ramping rate to for both natural and operational spills into the Mono Creek reach.

We find no information, either in the application or in the FS 4(e) rationale document, to show the effects of flow changes caused by spills to Mono Creek under the existing license. Not only is there no information to show the need for SCE to ramp flows, we also doubt SCE could meet the down ramping restrictions that FS sets in Section 4(e) condition 12 C.

We note that the project doesn't have a penstock or any other mechanism to divert flow away from Mono Creek during spills. Using the project's Howell-Bunger type valve would only serve the purpose of releasing part of any "natural spill" into Mono Creek, which would then combine with the flows SCE would be releasing to Mono Creek from the spillway. To manage inflows large enough to cause the reservoir to spill, SCE would have to estimate the storm inflow and make releases accordingly. Not only would the reservoir level change as the spillway gate settings are changed but also the outflow from the project would change and approximate the natural inflows. So, we don't see how SCE could hold the project reservoir spillway elevation and outflows constant until the spill ends as FS would require.

We conclude that Mono Creek ramping rates are not needed.

### **3. Threatened and Endangered Species**

In section V, we conclude that the project could potentially affect nesting and foraging eagles as a result of effects of project operation on food supply and the effects of disturbance from recreational boating and hiking, new recreational improvements, and project maintenance.

Therefore, we recommend SCE develop a bald eagle management plan to help keep conditions suitable for eagle nesting and foraging, provide for additional nesting territories, and minimize any potential conflicts with recreational use of Lake Edison. SCE should develop the management plan after consulting with the Forest Service and U.S. Fish and Wildlife Service. The plan should include: provisions for future bald eagle surveys, protection of nest and perch sites, restrictions on herbicide use at known foraging areas, public education relating to eagles, identification of eagle-human conflicts, and the provisions of SCE's Endangered Species Alert Program.

#### **4. Cultural**

To ensure that project operations would not have an adverse affect on project NRHP eligible properties (FRE-115, FRE-256/293, FRE-3186, the Mono Trail) and other cultural resources, a Programmatic Agreement (PA) would be initiated by the Commission, which would specify that SCE would develop and begin to implement a Vermilion Historic Properties Management Plan within 12 months of license issuance. The Programmatic Agreement would be between the Commission, SHPO, and ACHP, with SCE, FS, Indian Tribes, and other consulting parties, including local Native American groups asked to concur.

The HPMP would include provisions for preservation in place, monitoring, public education, consultation with Indian Tribes and concerned Native Americans, scientific data recovery, and amending the plan. The HPMP would attempt to balance the sensitivities of Native Americans about archaeological excavation against needs to mitigate potential loss of scientifically important data with data recovery.

The project HPMP would address both direct and potential cumulative effects.

#### **5. Recreational Resources**

At this time, SCE does not propose any new recreational enhancements or improvements at the project. Under revised preliminary condition No. 14 D, the FS proposes numerous improvements and measures at several recreation sites in the project area.

As previously discussed in the recreation section of this document, we think that additional recreation improvements or measures are needed at the Vermilion campground, Lake Edison boat launch, and the Vista Overlook to address the above problems and conditions and to accommodate the expected increase in future public use of the project area. Further, in accordance with Commission policy, additional improvements are needed at these sites to ensure that disabled persons have adequate access and use of the project's recreation resources. Based on our analysis, we concur with most, but not all of the FS's proposed improvements.

### **Vermilion Campground**

Improvements are needed to the Vermilion campground to make the area accessible to persons with disabilities and to replace outdated sanitary facilities. In this regard, we concur with the specific items in FS condition 14 D that relate to these needs, with the exception of the requirement for every campsite at the campground to be made accessible for disabled persons. Specifically, we do not think that it is necessary for every campsite in the campground to be modified and think modifying a reasonable number of the sites is sufficient to accommodate the needs of disabled persons. The specific number of campsites to be modified should be determined by SCE, the FS, and other interested parties during the preparation of a recreation plan for the project.

In addition, improvements to the interior road for the Vermilion campground are needed to address erosion and storm runoff problems. While the proposed road improvements in FS condition No. 14 D would improve the overall quality of the road, some of the improvements do not appear needed at this time. We think that only those specific improvements that would address existing erosion and storm runoff problems are appropriate and recommend that such improvements be implemented at the project. These improvements may include, among other things, repairing damaged road areas, reconstructing drainage ditches, erosion control measures, and replacing inadequate drainage pipes. The specific road improvements to be implemented should be determined by SCE, the FS, and other interested parties during the preparation of a recreation plan for the project.

We think that the installation of bear proof food storage containers and bear proof garbage bins identified in FS condition 14 D are appropriate and recommend they be implemented at the site. Finally, the FS has not shown that all the signage it would require SCE to install at the site is needed. Some of the proposed signage does not appear to provide significant benefits to the public using the site over existing conditions. We

think the number of needed signs to be installed should be determined by SCE, the FS, and other interested parties during the preparation of a recreation plan for the project.

### **Lake Edison Boat Launch**

The Edison lake boat launch site should be modified to be accessible to persons with disabilities and, thus, we concur with the measures in FS condition No. 14 D that would meet this need. Further, we also concur with the bear-proof garbage bin which would reduce the risk of conflicts between bears and recreationists.

In addition, we concur with the proposed development of defined dispersed camping sites at the entrance to the boat launch area and think that such a measure would address existing environmental problems in the area as well as, provide dispersed camping opportunities for disabled persons. However, while the FS proposes up to eight sites be developed, no supporting information has been provided regarding the number of sites that would be appropriate. For this reason, we recommend the number of sites to be developed should be decided by SCE, the FS, and other interested parties during the preparation of a recreation plan for the project.

Finally, we think that it is appropriate to either replace the existing ramp or resurface it and to extend the ramp into the reservoir so that it can be safely used at low water levels. We recommend the specific method of renovation of the boat ramp should be determined by SCE, the FS, and other interested parties during the preparation of a recreation plan for the project.

### **Vista Overlook**

We concur with the improvements in FS condition 14 D as they would make the site more accessible to disabled persons. Further, we concur with FS's proposed requirement to replace the existing barrier poles at the site's rock monument with rock pillars and the installation of interpretive signs at the site. These improvements would enhance the attractiveness of the site and provide educational benefits to the public.

### **Recreation Management**

As we've said in the Recreational resources section, FS revised preliminary Section 4(e) condition 14 A would require SCE to do a recreation survey and prepare a report once every six years to identify changes in the recreation uses and activities in the project area. Condition 14 B would require SCE to prepare and file a recreation plan

within 1 year following the issuance of a new project license.

We concur with FS conditions 14 A and B requiring the preparation of a recreation plan for the project and periodic recreation surveys. And, we recommend that such requirements be included in any license issued for the project. The recreation plan should include provisions for the periodic recreation surveys and incorporate the recreation facilities and improvements approved by the license. In addition, the plan should include provisions to consider and implement appropriate changes to the project's recreation plan should future recreation needs or plans for the Big Creek Hydro System affect the Vermilion Valley Project.

In addition, in condition 14 C, the FS proposes SCE provide annual contributions regarding the operation, maintenance, and future construction of recreation facilities in the project area, including dispersed public use areas. This condition also requires SCE to provide annual funding for the FS's oversight of its concessionaire special use permit. In response, SCE says that condition 14 C should only apply to project-related recreation facilities within the project boundary and not other recreation facilities in the project area, and that it should not be required to provide funding for FS oversight of concessionaire operations, noting that concessionaires already benefit from user fees and should pay their own operating costs.

As we've said in the recreation resources section, SCE should only be responsible for project-related recreation facilities and dispersed public use areas directly related to the recreational use of project lands and waters. Further, we do not think that SCE should be responsible for FS funding oversight of its concessionaire special use permit.

However, we think that SCE should share in the funding responsibilities for the project related facilities and that the plan should contain funding provisions for the construction, operation, and maintenance of these recreation facilities.

### **Snow Removal**

On rare occasions, it has been necessary for SCE to clear Kaiser Pass Road of snow during the winter to access project facilities for emergency work. It appears that this emergency work requires the road to be closed at times. During such periods, snowmobile use of the Kaiser Pass Trail, which occupies the road under normal conditions, is adversely affected. SCE has in the past and plans to continue to consult with the FS should it become necessary to clear Kaiser Pass Road.

In this regard, we concur with SCE's plans to continue to consult with the FS on emergency snow removal of Kaiser Pass Road. While we do not think that a full maintenance protocol is necessary for emergency access, we believe that SCE should evaluate, in consultation with the FS and the National Park Service, the effects of this emergency access on snowmobile use of Kaiser Pass Trail and, determine what, if any measures, can be taken to address such effects, while still maintaining the necessary emergency access to project works. The results of this consultation, including any SCE proposed or agency recommended measures, should be included in any recreation plan filed with the Commission.

### **Road Improvements and Management**

In its revised preliminary conditions, the FS includes several conditions related to the use and maintenance of roads in the project area, including the preparation of a Transportation System Management Plan. As discussed below, we concur with the FS's recommendation that SCE develop a Transportation System Management Plan for project related roads.

Condition 15 A requires SCE to develop a Transportation System Management Plan to protect and maintain roads associated with the project license. The plan is to include a map showing the location of project related roads in the area and provisions addressing road maintenance, repair, and management. While implementation of the Transportation System Management Plan would ensure that roads in the project area are adequately operated and maintained in a manner that protects the public and prevents or minimizes erosion damage, we do not believe that SCE should be largely responsible for these roads, given that SCE shares the use of these roads with others who use them to access non-project related recreation areas.

Based on our review of the available information, it appears that SCE primarily uses FS public roads to access project facilities and works for operation and maintenance purposes and that these same roads are used by the FS and others, including the public, to, among other things, access recreation areas and trails unrelated to project recreation resources. Although most of these roads appear to be located outside the project boundary, they are used, in part, by SCE for project operations. As such, it would be appropriate for SCE to contribute, in part, to the operation and maintenance of these roads, commensurate with its use of these roads. The details regarding the type, level, and nature of SCE's contribution to road operation and maintenance should be determined as part of the preparation of the Transportation System Management Plan.

Condition 15 B requires, in part, SCE to implement specific road improvement projects as part of the transportation system management plan. It is clear that implementation of these specific projects would improve road conditions in the area and provide enhanced public use of these roads and reduce erosion impacts associated with this usage. However, as we noted above, SCE should not be fully responsible for operation and maintenance of these roads and should share in these responsibilities, equivalent to its use of the roads. In this regard, SCE not be fully responsible for the identified road improvement projects, but only a part of the projects, equal to SCE's use of the identified roads for project purposes. The details regarding SCE's specific involvement with these road improvement projects should be determined as part of the preparation of the Transportation System Management Plan.

Regarding condition 15 C (formerly original preliminary condition No. 13), SCE is concerned that the FS reservation to allow the public use of roads in the area may include roads that it may consider to be a public safety hazard. In accordance with Commission regulations, a licensee has specific public safety responsibilities regarding its licensed project, and, under certain standard license conditions, it has the authority to preclude public access to project facilities, waters, and lands, as necessary for the protection of life, health, or property. In this regard, we would expect that appropriate safety measures would be implemented at the project, including prohibiting public access to certain areas if necessary, in order to protect the public and ensure safe project operations.

### **Cost of measures**

At this time, SCE does not propose any new recreational enhancements or improvements at the project. Under revised preliminary condition No. 14 D, the FS proposes numerous improvements and measures at several recreation sites in the project area.

In Appendix C of its supplemental information dated January 31, 2003, SCE provides FS overall cost estimates for the recreation enhancements/facilities at the three recreation areas identified in condition No. 14 D. These cost estimates are also included on page 21 of the rationale for the FS's revised preliminary conditions filed March 9, 2004. Specifically, the FS estimates that the total construction costs for the desired improvements are as follows:

Vermilion Campground improvements	- \$480,000.00
Lake Edison Boat Launch improvements	- \$300,000.00
Vista Overlook improvements	- \$65,000.00

Further, the FS estimates that other costs associated with the improvements, such as mobilization, profit and overhead, preconstruction engineering, site environmental analysis, and administrative expenses would be \$675,000.00, bringing the total estimated cost of the improvements to \$1,520,000.00.

We've previously identified various recreation improvements that we think are appropriate at the above recreation areas. The staff's proposed improvements include most, but not all, of the FS's proposed improvements.

Given that SCE has not yet proposed any recreational enhancement measures, we do not have cost estimates for any facility enhancements that may be the result of future talks with the FS. Further, the FS's cost estimates above are not detailed cost estimates for each specific proposed improvement, but a total cost estimate for all the improvements at each recreation area. Based on this general cost information, we estimate that the total cost of staff's proposed improvements at the three recreation areas are as follows:

Construction Costs

Vermilion Campground Improvements-	\$ 430,000.00
Edison Lake Boat Launch Improvements -	\$ 200,000.00
Vista Overlook Improvements -	\$ 65,000.00

Further, we estimate that the other associated costs for staff's proposed improvements at these recreation areas would be similar to the FS estimate of \$675,000.00. As such, the total estimated cost for staff's proposed recreation improvements would be \$ 1,370,000. In turn, we estimate that the annual cost of implementing appropriate recreational improvements at the project to be about \$ 99,500.

As we say in the recreation section, we think staff's proposed recreation improvements will provide needed enhancements at the project to ensure that project-related recreation facilities and areas will continue to meet the needs of the public and provide a high-quality recreational experience that protects environmental resources. For this reason, we think the benefits of this measure would justify some added cost to the project.

**Sharing Trout Stocking Costs**

SCE proposes to continue stocking rainbow trout from its trout-rearing facility, in

consultation with CDFG, to support recreational fishing in the project area. However, in its September 4, 2002, letter to the Commission, SCE states that its participation in fish stocking efforts is, and should remain, voluntary and should not be required as part of any new license that may be issued for this project.

CDFG recommends that SCE provide a fair share (50 percent) of the fish production costs that is needed to sustain a fishery in Lake Edison and Mono Creek, unless agreed otherwise by CDFG and SCE. CDFG notes that fisheries in the project area provide high-demand angling opportunities for recreational users of Lake Edison and other project stream reaches and SCE's contribution to the stocking costs would offset the effects of the annual seasonal drawdowns of Lake Edison and project-related stream flow reductions.

Project waters are stocked with trout to provide recreational fishing opportunities and harvest in excess of that which could be supported by the natural productivity of the project area. Given the high-quality recreational fishing opportunities at the project, largely due to fishing stocking in the area, and the importance of this public benefit of the project, SCE should support CDFG's fishing stocking efforts beyond its current voluntary fish stocking program. While CDFG has not provided adequate justification for its recommendation that SCE contribute 50% of the fish production costs for sustaining a fishery in Lake Edison and Mono Creek, we think it's appropriate for SCE to contribute 50% of the fish production costs associated with project waters. The specific details regarding SCE's financial contribution and its involvement in fish stocking efforts at the project should be determined by SCE and the CDFG during the preparation of a recreation plan for the project and included as a provision of the final plan.

### **Annual Contribution for Recreation Management**

In revised preliminary condition No. 14 C, the FS would require SCE to contribute to the FS \$7,500 annually for FS monitoring and permit compliance of concessionaire special use permits and \$5,500 annually for management and monitoring of dispersed public use sites (overnight camping and day use) in the project area around Lake Edison. Since concessionaires can charge fees to help defray costs, we do not think that SCE should be responsible for an annual contribution of \$7,500 for concessionaire operations. Further, we also think that SCE should only be responsible for part of the \$5,500 annual contribution FS would require for management and monitoring of dispersed public use sites. Specifically, we find that SCE should only contribute funding for the dispersed public use sites that are directly related to recreational use of project lands and waters, such as dispersed camping activities near the Lake Edison boat launch site.

We conclude that SCE and the FS should share funding responsibilities for project-related recreation facilities and that the project's recreation plan should contain funding provisions for the construction, operation, and maintenance of project related recreation facilities. In this regard, SCE and the FS should determine how much of the \$5,500 annual contribution for dispersed public use sites is directly related to the project and consider the matter as part of the plan's overall funding provisions.

At this time, we do not have detailed information regarding the FS's \$5,500 annual contribution requirement. However, absent this information and considering the extent of dispersed overnight camping and day use activities around Lake Edison, it appears that it would be appropriate for the SCE to provide the FS 50% of the \$5,500 annual contribution, or \$2,250, for the management and monitoring of project-related, dispersed, public use sites. This annual contribution would help ensure that these sites are managed in a manner that protects and enhances the project resources.

## **6. Visual Resources**

As noted in the Aesthetic Resources section, the project does not have a significant adverse visual effect on the surrounding area and, as a result, we do not recommend any measures to mitigate or minimize specific visual effects at this time. However, if future changes are made to existing project facilities or features, including changes resulting from maintenance or repair activities, or if new facilities are constructed, including recreational enhancements, these new or modified facilities or features could have adverse visual effects and it would be appropriate to consider how such potential effects could be mitigated or minimized in the design, modification, or construction of such project facilities or features.

Given this information and the attractive scenic setting of the project area, we concur with the FS's recommendation for the development of a visual resources plan for the project. However, given the absence of significant project works (i.e. powerhouse, transmission lines, etc.) and the minimal adverse visual effect of existing project facilities or features on the surrounding area, the plan should not address the visual effect of existing project facilities and features, but only address future changes to these existing facilities and features and new project facilities or changes. The development and implementation of such a plan would ensure that changes to existing project facilities and features and new facilities are constructed, designed, or implemented in a manner that mitigates for or minimizes potential adverse visual effects on the surrounding area throughout the term of any license issued for the project.

## VIII. RECOMMENDATIONS OF FISH AND WILDLIFE AGENCIES

Under the provisions of the FPA, each hydroelectric license issued by the Commission shall include conditions based on recommendations provided by federal and state fish and wildlife agencies for the protection, mitigation, and enhancement of fish and wildlife resources affected by the project.

Section 10(j) of the FPA states that whenever the Commission believes that any fish and wildlife agency recommendation is inconsistent with the purposes of the requirements of the FPA or other applicable law, the Commission and the agency shall attempt to resolve any such inconsistency, giving due weight to the recommendations, expertise, and statutory responsibilities of such agency.

In response to the REA notice, Interior, by letter dated June 4, 2002, state that they had reviewed the license application and have no comments to offer.

Table F&W-1 lists the recommendations from CDFG subject to Section 10(j), and whether or not we adopt the recommendations under the staff alternative. CDFG provided its comments by letter filed with the Commission on June 10, 2002. Recommendations that we consider outside the scope of Section 10(j) have been considered under Section 10(a) of the FPA and are addressed in the specific resource sections of this document and in the Comprehensive Development section.

*Table FW-1. Analysis of fish and wildlife agency recommendations for the Vermilion Valley Project. (Source: Staff)*

Recommendation	Agency	Subject to Section 10(j)	Annual cost	Conclusion
1. Consult with agencies to develop a minimum pool level to maintain in Lake Edison during critically dry, dry, below-normal, normal and above normal years.	CDFG	No	\$50,000 to \$75,000	Not a specific measure to protect fish and wildlife. Without knowing what specific minimum pool level is recommended, we can't agree that the minimum reservoir

				level would benefit aquatic resources and we can't predict how setting the minimum level could affect the project's power benefits.
2. Require the license to contribute a reasonable share of the fish production that is needed to sustain a fishery in Lake Edison and Mono Creek.	CDFG	No	\$2,000	Not a specific measure to protect fish and wildlife. However, as we discuss in the Recreation Section, we think it's reasonable for SCE to cover a reasonable share of the stocking costs.
3. Consider flow regimes equal to or (preferably) greater than the actual flows, as provided under the past license.	CDFG	No	\$9,875	Not a specific measure to protect fish and wildlife. However, Staff recommends the instream flows that the draft 4(e) conditions require in Warm and Mono Creek.

## IX. CONSISTENCY WITH COMPREHENSIVE PLANS

Section 10(a)(2) of the FPA requires the Commission to consider the extent to which a project is consistent with federal and state comprehensive plans for improving, developing, and conserving waterways affected by the project. Under Section 10(a)(2), federal and state agencies filed 39 plans that address various resources in California.

Fourteen of these plans address resources relevant to the Vermilion Valley Project.<sup>15</sup> No conflicts were found with the plans.

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## **X. FINDING OF NO SIGNIFICANT IMPACT**

Continuing to operate the Vermilion Valley Project, with our recommended measures, involves little or no land-disturbing or land-clearing activities. Our recommended protection and enhancement measures would require SCE to raise the instream flow in Mono Creek, release higher flushing flows in Warm Creek, monitor iron and manganese levels, and develop a plan to improve existing recreational facilities. Also, with execution and implementation of the PA, and development and implementation of the HPMP, no significant effects on cultural/heritage resources should occur.

Based on our independent analysis, issuance of a new license to the Vermilion Valley Project with our recommended environmental measures would not be a major federal action significantly affecting the quality of the human environment.

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APPENDIX A

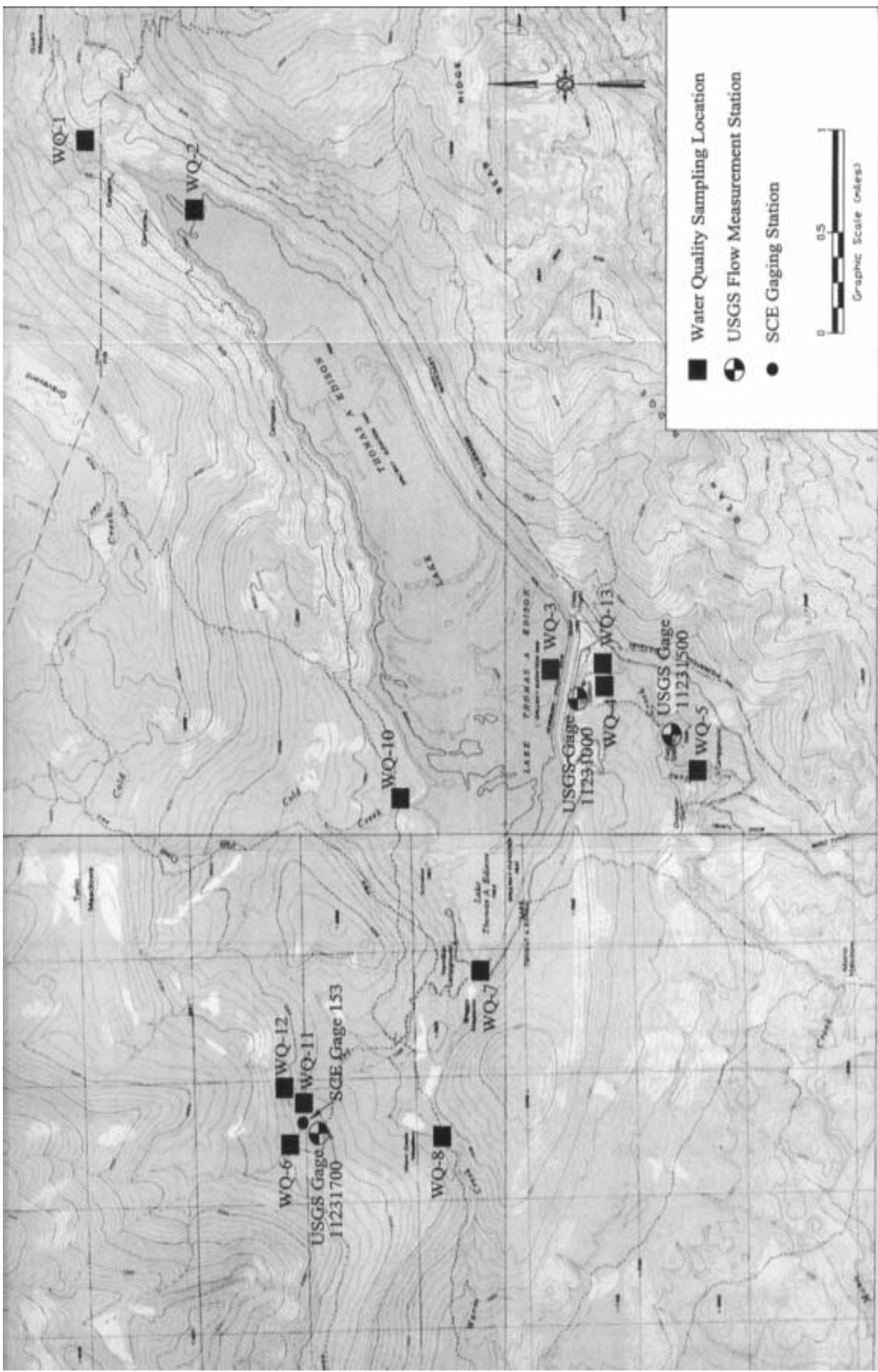


Figure WR-1. Water quality stations. (Source: SCE, 2001)

## **APPENDIX B**

### **REVISED PRELIMINARY LICENSE CONDITIONS NECESSARY FOR THE PROTECTION AND UTILIZATION OF THE SIERRA NATIONAL FOREST IN CONNECTION WITH THE APPLICATION FOR LICENSE, PROJECT NO. 2086, VERMILION VALLEY PROJECT SOUTHERN CALIFORNIA EDISON COMPANY**

#### **I. GENERAL**

The Forest Service provides the following preliminary 4(e) conditions for the Vermilion Valley Project, FERC No. 2086 in accordance with 19 CFR 4.34(b)(1)(i)

License articles contained in the Commission's Standard Form L-1 (revised October 1975) issued by Order No. 540, dated October 31, 1975, cover general requirements that the Secretary of Agriculture, acting by and through the Forest Service, considers necessary for adequate protection and utilization of the land and resources of the Sierra National Forest. Section 4(e) of the Federal Power Act states the Commission may issue a license for a project within a reservation only if it finds that the license will not interfere or be inconsistent with the purpose for which such reservation was created or acquired. This is an independent threshold determination made by FERC, with the purpose of the reservation defined by the authorizing legislation or proclamation (see *Rainsong v. FERC*, 106 F.3d 269 (9<sup>th</sup> Cir. 1977)). The FS may rely on broader purposes than those contained in the original authorizing statutes and proclamations in prescribing conditions (see *Southern California Edison v. FERC*, 116F.3d 507 (D.C. Cir. 1997)).

Under authority of Section 4(e) of the Federal Power Act (16 U.S.C. 797(e)), the following terms and conditions are deemed necessary for adequate protection and utilization of the Sierra National Forest lands and resources. These terms and conditions are based on those resource and management requirements enumerated in the Organic Administration Act of 1897 (30 Stat. 11), the Multiple-Use Sustained Yield Act of 1960 (74 Stat. 215), the National Forest Management Act of 1976 (90 Stat. 2949), and any other law

specifically establishing a unit of the National Forest System or prescribing the management thereof (such as the Wilderness Act or the Wild and Scenic Rivers Act), as such laws may be amended from time to time, and as implemented by regulations and approved Land and Resource Management Plans prepared in accordance with the National Forest Management Act. Specifically, the 4(e) conditions are based on the Land and Resource Management Plans (as amended) for the Sierra National Forest, as approved by the Regional Forester of the Pacific Southwest Region. Therefore, pursuant to section 4(e) of the Federal Power Act, the following conditions covering specific requirements for protection and utilization of National Forest System lands shall also be included in any license issued.

## **II. STANDARD FOREST SERVICE PROVISIONS**

### **Condition No. 1- CONSULTATION**

Each year, the Licensee shall consult with the Forest Service with regard to measures needed to ensure protection and utilization of the National Forest resources affected by the project. The date of the consultation meeting will be mutually agreed to by the Licensee and the Forest Service but in general will be held 60 days prior to the beginning of the recreation season to facilitate implementation of flow management requirements and recreational management activities. Within 60 days following such consultation, the Licensee shall file with the Commission evidence of the consultation with any recommendations made by the Forest Service. The Forest Service reserves the right, after notice and opportunity for comment and administrative review, to require changes in the project and its operation through revision of the 4(e) conditions that require measures necessary to accomplish protection and utilization of National Forest resources.

### **Condition No. 2- APPROVAL OF CHANGES AFTER INITIAL CONSTRUCTION**

Notwithstanding any Commission approval or license provisions to make changes to the project, the Licensee shall get written approval from the Forest Service prior to making any changes in the location of any constructed project features or facilities, or in the uses of project lands and waters, or any departure from the requirements of any approved exhibits filed with the Commission.

Following receipt of such approval from the Forest Service, and at least 60 days prior to initiating any such changes or departure, the Licensee shall file a report with the Commission describing the changes, the reasons for the changes, and showing the approval of the Forest Service for such changes. The Licensee shall file an exact copy of this report with the Forest Service at the same time it is filed with the Commission. This article does not relieve the Licensee from the amendment or other requirements of Article 2 or Article 3 of this License.

**Condition No. 3- MAINTENANCE OF IMPROVEMENTS**

The Licensee shall maintain the improvements and premises to standards of repair, orderliness, neatness, sanitation, and safety. For example, trash, debris, unusable machinery, etc., will be disposed of separately; other materials will be stacked, stored neatly, or within buildings. Disposal will be at an approved existing location, except as otherwise agreed to by the Forest Service.

**Condition No. 4- EXISTING CLAIMS**

The license shall be subject to all valid claims and existing rights.

**Condition No. 5- COMPLIANCE WITH REGULATIONS**

The Licensee shall comply with the regulations of the Department of Agriculture and all Federal, State, county, and municipal laws, ordinances, or regulations in regard to the area or operations covered by this license, to the extent federal law does not preempt ordinances or regulations.

**Condition No. 6- PROTECTION OF UNITED STATES PROPERTY**

The Licensee shall exercise diligence in protecting from damage the land and property of the United States covered by and used in connection with this license.

**Condition No. 7- SURRENDER OF LICENSE OR TRANSFER OF OWNERSHIP**

Prior to any surrender of this license, the Licensee shall restore National Forest System resources to a condition satisfactory to the Forest Service. In advance of the proposed surrender, the Licensee shall file a restoration plan for approval by the Forest Service. The restoration plan shall identify the measures to be taken to restore National Forest System resources and shall include adequate financial assurances such as a bond or letter of credit, to ensure performance of the restoration measures.

Any agreement made by the licensee to transfer or sell the License shall require the transferee or purchaser to post a bond to cover the cost of surrender and restoration of National Forest System resources. Prior to any request for approval from the commission for a sale or transfer of ownership of the license, the licensee shall pay for the cost of experts, selected by the Forest Service, to develop a restoration plan and estimate the cost of surrender and restoration. The licensee will not request approval from the commission for the sale or transfer until the restoration plan and cost estimates are completed and the transferee or purchaser posts a bond, approved by the Forest Service, to cover the estimated cost of surrender and restoration.

#### **Condition No. 8- INDEMNIFICATION**

The Licensee shall indemnify, defend, and hold the United States harmless for any costs, damages, claims, liabilities, and judgments arising from past, present, and future acts or omissions of the Licensee in connection with the use and/or occupancy authorized by this license. This indemnification and hold harmless provision applies to any acts and omissions of the Licensee or the Licensee's heirs, assigns, agents, employees, affiliates, subsidiaries, fiduciaries, contractors, or lessees in connection with the use and/or occupancy authorized by this license which result in: (1) violations of any laws and regulations which are now or which may in the future become applicable, and including but not limited to environmental laws such as the Comprehensive Environmental Response Compensation and Liability Act, Resource Conservation and Recover Act, Oil Pollution Act, Clean Water Act, Clean Air Act; (2) judgments, claims, demands, penalties, or fees assessed against the United States; (3) costs, expenses, and damages incurred by the United States; or (4) the release or threatened release of any solid waste, hazardous substances, pollutant, contaminant, or oil in any form in the environment.

#### **Condition No. 9- DAMAGE--HIGH HAZARD**

The Licensee is hereby made liable for all injury, loss, or damage to the United States land and property, including but not limited to fire suppression costs, directly or indirectly resulting from or caused by the Licensee's power lines covered by this license, or any other

high risk use and occupancy of the area covered by this license, regardless of whether the Licensee is negligent or otherwise at fault, provided that the maximum liability without fault shall not exceed \$1,000,000 for any one occurrence, and provided further that the Licensee shall not be liable when such injury, loss, or damage results wholly, or in part, from a negligent act of the United States, or from an act of a third party not involving the facilities of Licensee.

Determination of liability for injury, loss, or damage, including fire suppression costs, in excess of the specified maximum, shall be according to the laws governing ordinary negligence.

#### **Condition No. 10 - RISKS AND HAZARDS**

The Licensee is responsible for inspecting its site, right of way and immediate adjoining area for dangerous trees, hanging limbs, and other evidence of hazardous conditions and is responsible for removing such hazards, after securing permission from the Forest Service, except in an emergency where there is an imminent risk of death or injury to the public or facilities in which case the Licensee shall notify the Forest Service of the action as soon as possible.

#### **Condition No. 11- PESTICIDE-USE RESTRICTIONS**

Pesticides may not be used to control undesirable woody and herbaceous vegetation, aquatic plants, insects, rodents, trash fish, etc., without the prior written approval of the Forest Service. The Licensee shall submit a request for approval of planned uses of pesticides. The request must cover annual planned use and be updated as required by the Forest Service. The Licensee shall provide information essential for review in the form specified by the Forest Service. Exceptions to this schedule may be allowed only when unexpected outbreaks of pests require control measures that were not anticipated at the time the report was submitted. In such an instance, an emergency request and approval may be made.

The Licensee shall use on National Forest System land only those materials registered by the U.S. Environmental Protection Agency for the specific purpose planned. The Licensee must strictly follow label instructions in the preparation and application of pesticides and disposal of excess materials and containers.

### III. ADDITIONAL FOREST SERVICE PROVISIONS

#### Condition No. 12 – FLOW MANAGEMENT

Written consent from the Forest Service will allow the flow management requirements listed in this condition to be temporarily modified, during and to the extent required for: 1) performance of required maintenance of the dams, their outlet facilities, and minimum flow release facilities; 2) operational emergencies beyond the control of the Licensee; and 3) in the interest of public safety. The Licensee shall notify the Forest Supervisor at least five working days prior to any such departure, except during emergencies.

##### A. Minimum Streamflow Requirement

During the operation of the facilities authorized by the license, the Licensee shall maintain the following minimum flows or the natural flow, whichever is less, as measured at the gage locations indicated. Minimum flow shall be measured in two ways: as the seven-day average of the flow and as a minimum instantaneous flow. Instantaneous flow is defined to be the flow value used to construct the average daily flow value such as the 15 minute flow. Water Year type will be assessed using the April 1<sup>st</sup> delineation according to the San Joaquin Four Rivers Index or its successor.

##### 1. Mono Creek below Vermilion Valley Dam – USGS Gage 11231500

Sept 15 <sup>th</sup> thru Dec 15 <sup>th</sup> :	7 day average of 25 cfs, instantaneous floor of 20 cfs
Dec 16 <sup>th</sup> thru Apr 30 <sup>th</sup> :	7 day average of 18 cfs, instantaneous floor of 15 cfs
May 1 <sup>st</sup> thru Sept 14 <sup>th</sup> :	7 day average of 20 cfs, instantaneous floor of 16 cfs

##### 2. Warm Creek below diversion – USGS Gage 11231700

Year-round instantaneous minimum flow of 0.2 cfs

### **B. Instream Flow Measurement:**

The Licensee shall measure and document all instream flow releases in publicly available and readily accessible formats. For the purposes of measuring and documenting compliance with the required minimum instream flows in the Mono Creek and Warm Creek Project bypass reaches, the Licensee shall prepare and file with the Commission an Instream Flow Measurement Plan (Plan) that is approved by the Forest Service.

The Plan shall include a description of existing or proposed instream flow measurement gages or devices, including flow gages, spillway or reservoir outlet discharge measurement devices, etc., and a detailed proposal for measuring instream flow in each of the Project reaches with existing or proposed devices. The Plan must describe existing or proposed provisions for making mean daily flow data available to the public, and for making 15 minute or hourly gage data available to the Forest Service.

The Plan shall include evidence of gage calibration and historical and recent cross-section data, if applicable. The Licensee shall submit the Plan to the Forest Service as soon as practicable and no later than one year after license issuance and shall not begin construction of flow measurement devices or implementation of Plan elements until the Plan has been formally approved in writing from the Forest Service and filed with the Commission.

There is presently no year round flow measurement device in the Warm Creek Project bypass reach. Interim to implementation of the above Plan, compliance in the Warm Creek will be met based on the best available methods.

### **C. Ramping Rates for Mono Creek**

The Licensee shall within one year of license issuance, obtain Forest Service approval and file with the Commission a plan to operate the Project to minimize impacts to the recession limb of natural and operational spills into the Mono Creek Project reach. The resulting plan shall regulate both the up ramping and down ramping rates of emergency or planned maintenance outages (with the exception of up ramp rates of some emergency spills, which cannot be managed), for the purpose of minimizing negative ecological effects of unnaturally rapid flow and stage fluctuations.

**Natural Spills:** Down ramping of natural spills (i.e., inflows to the Project bypassed reach that exceed the capacity of the reservoir and

diversion structures) shall downramp at approximately the same rate as the natural attenuation of the inflow that caused the spill (i.e., no manipulation of reservoir levels and penstock releases during spills), or downramp slowly enough so as not to produce stage changes at any approved Project bypassed reach stage gage exceeding two-tenths of one foot per hour. During such time the Licensee shall either: (1) hold the Project reservoir spillway elevation and outflows (penstock diversion and instream flow diversion) magnitudes constant until the completion of the spill (i.e., flow over spillway ceases); and/or (2) develop a stage management protocol, approved by the Forest Service, to manually manage the spill discharge into the Project reach at the approved Project reach stage gage.

**D. Riparian Enhancement Flow Plan for Mono Creek:**

Each year sometime during the period between June 15<sup>th</sup> thru July 31<sup>st</sup>, the licensee shall release into Mono Creek below the dam the flows prescribed in the table below.

	Average daily flow at least equal to:
Day 1	250 cfs
Day 2	450 cfs
Day 3	450 cfs
Day 4	350 cfs
Day 5	350 cfs
Day 6	350 cfs
Day 7	350 cfs
Day 8	350 cfs
Day 9	350 cfs
Day 10	250 cfs
Day 11	250 cfs
Day 12	250 cfs
Day 13	250 cfs
Day 14	150 cfs

Day 15	150 cfs
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This flow release need not be made if “Natural” spill events between February 1<sup>st</sup> and July 31<sup>st</sup> or “Operational” spill events between June 1<sup>st</sup> and July 31<sup>st</sup> of either the current or preceding water year meet all of the following characteristics:

1. an average daily flow of at least 450 cfs for two consecutive days, and
2. a minimum of 14 days of average daily flows greater than 150 cfs within the periods defined above that have a total flow volume of at least 9000 ac-ft.

The licensee shall inform the Forest Service at the annual consultation meeting whether flow events occurred in the previous water that meet this criteria. If such events did not occur, the licensee shall plan to release the above defined flow event unless spill events occur prior to July 31<sup>st</sup> that meet the criteria.

(For this condition, the definition of a “natural” spill is a flow event into the bypass channel that exceeds the storage capacity of the reservoir and the capacity of the diversion structure. An operational spill is defined as a flow event into the bypass channel that could have been held as storage in the reservoir).

#### **E. Warm Creek Channel Maintenance and Flushing Flows:**

For channel maintenance and flushing flows, the Licensee shall leave the Warm Creek diversion turned out to the natural channel until July 1<sup>st</sup>, in wet water year types, based on the April 1<sup>st</sup> forecast for the San Joaquin Four Rivers Index or its successor.

#### **F. Monitoring**

**Fish Monitoring.** The licensee shall conduct quantitative fish population monitoring every ten years within Mono Creek (downstream of the dam); Warm Creek (above and below the diversion); and Boggy Meadow Creek. The objectives of the fish population monitoring are to provide information on the fish population over the period of the new license. Fish monitoring will occur at similar electrofishing sites and during the same time of year as the monitoring conducted by licensee in 2001. The monitoring will determine the fish species composition in the project area and estimate (for each species present) the abundance by life stage, and the size (length

and weight) distribution.

Fish monitoring in Boggy Meadow Creek will focus on any changes in fish populations potentially attributable to the implementation of the Channel Maintenance Flows in Warm Creek that may divert flows previously routed to Boggy Meadow Creek

A draft technical report providing the results of the fish population survey will be prepared within 4 months following completion of the fieldwork. The report will include a map showing the locations of the monitoring stations. The report will provide tabular results for numbers captured and average length and weight for each species at each station. The table will also provide computed abundance, total length, length/weight ratios, average condition factors, and biomass estimates, with 95 percent confidence limits for each species. The report will also provide a graph of the combined length-frequency distribution from all monitoring stations.

In addition to describing the results, the report will compare the results with results of previous fish population surveys from each monitoring sites and will discuss implications regarding trends in fish abundances. The population information can be compared with fish population data collected during the 2002/2003 project relicensing.

1. **Sediment Monitoring.** Within one year of the date of acceptance of this license, the Licensee shall file with the Director, Office of Hydropower Licensing, a plan approved by the Forest Service for sediment management within the Project area. Licensee will develop a plan to monitor and address (A) sediment accumulation in Warm Creek below the diversion and (B) project related sediment sources in the Warm Creek diversion channel. The Licensee shall develop the plan in consultation with the Forest Service and other appropriate federal and state resource agencies. The plan will include at a minimum the following components:

**Sediment Accumulation in Warm Creek.** The licensee shall conduct periodic quantitative monitoring of sediment conditions in Warm Creek above and below the Warm Creek diversion. Sediment monitoring would occur immediately upon completion of the Sediment Management Plan and thereafter every ten years concurrent with the fisheries monitoring described above, until termination of the license. SCE will conduct no less than four monitoring periods during the license term (baseline plus three additional monitoring surveys). Monitoring would consist of a combination of methods which may include V\*, substrate embeddedness, Wolman pebble counts, monumented cross sections, or other quantitative methods agreed upon and approved by the Forest Service. The section of Warm Creek immediately above the Warm Creek

diversion would be used as a reference with which to compare downstream sediment conditions. A draft technical report will be provided to the Forest Service and other appropriate federal and state resource agencies within six months of the monitoring date. The report will include a map showing monitoring locations, results, and interpretation of quantitative sediment data, and comparison to previous sediment condition data. Sediment Management Plan results would be discussed during the annual consultation meeting with the Forest Service.

**Warm Creek Diversion Channel Erosion Control Management Plan**, which will include the following components:

- i) Identification and delineation of project-related sediment sources within the Warm Creek Diversion channel. SCE management activities contributing sediment will be identified and specific causes evaluated.
- ii) A prescription section will recommend management measures and procedures (as necessary) designed to reduce sediment movement and delivery to the Warm Creek Diversion Channel and Boggy Meadow Creek. Procedures may include: a) revegetating slopes exposed by past land management practices; b) stabilizing banks and slopes with manmade or natural materials and c) other bioengineering practices.
- iii) An implementation section (as necessary) will identify scheduling for completion of the identified stabilization projects. Effectiveness monitoring will be conducted for the projects within 3 years of completion and a project maintenance schedule will be identified as necessary.

### 3.

**Mono Creek Riparian Community Monitoring** The licensee shall conduct quantitative riparian monitoring every ten years in the Mono Creek bypass reach at sites comparable to where data was collected for the 2003 relicensing. Data collected will be similar to that collected for the 2003 relicensing and include plant species composition, percent cover, height and canopy structure, relative density, size classes present, evidence of unusual mortality, structural diversity, and width of the riparian zone. Incidental wildlife observation, presence of diagnostic sign (e.g. tracks, scat, feathers, etc) and habitat suitability will also be collected.

A draft technical report will be provided to the Forest Service and other appropriate federal and state resource agencies within six months of the monitoring date. The report will include a map showing monitoring locations, results, and interpretation of

quantitative riparian data, and comparison to previous data. Results would be discussed during the annual consultation meeting with the Forest Service.

### **Condition No. 13 – PROTECTION OF FOREST SERVICE SPECIAL STATUS SPECIES**

Before taking actions to construct new project features on NFSL that may affect Forest Service special status species (i.e. Forest Service sensitive and/or management indicator species) or their critical habitat, the Licensee shall prepare a biological evaluation evaluating the potential impact of the action on the species or its habitat and submit it to the Forest Service for approval. In coordination with the Commission, the Forest Service may require mitigation measures for the protection of the affected species.

The biological evaluation shall

- Include procedures to minimize adverse effects to special status species.
- Ensure project-related activities shall meet restrictions included in site management plans for special status species.
- Develop implementation and effectiveness monitoring of measures taken or employed to reduce effects to special status species.

### **Condition No. 14: RECREATION RESOURCE MANAGEMENT**

#### **A. Report on Recreational Resources**

Licensee shall prepare a Report on Recreational Resources once every six years from license issuance. The Report on Recreational resources shall comply with the FERC's regulations at 18 CFR section 4.51(f) (1996), and shall be provided to the Forest Service for review and comment prior to being filed with the Commission. The report shall be based on a recreational survey that shall include but not be limited to changes in kinds of use and use patterns, user survey as to preferences in recreation activities, kinds and sizes of recreation vehicles, preference for day use versus overnight use and recreation user trends within the project area. A copy of the survey and survey results will be provided to the Forest Service. The Forest Service reserves the right, after notice and opportunity for comment and administrative review, to require changes in the project and its operation through revision of the 4(e) conditions that require measures necessary to accomplish protection and utilization of National Forest resources identified as a result of these surveys.

### **B. Recreation Plan- Facilities and Interpretive Services**

The Licensee shall file a Recreation Plan with the Commission within one year following the issuance of a new project license. This plan will be submitted to the Forest Service for approval prior to filing with the Commission. The plan will address development and management of project related recreation opportunities. Project specific construction or implementation plans will be developed by the Licensee for required facilities, and will be submitted to the Forest Service for approval prior to construction. Approved construction plans will be incorporated into the Recreation Plan and filed with the Commission.

Unless otherwise agreed upon by the Forest Service, the Licensee shall be responsible for maintenance, repair and major rehabilitation of project recreation facilities, which are defined to include any Licensee owned or Forest Service owned facilities that are included in the Recreation Plan.

### **Operation and Maintenance Responsibilities**

The licensee shall contribute annually by October 1, \$7,500 per year (year 2002 cost basis) to the Forest Service for monitoring and permit compliance assurance for the campground concessionaire Special Use Permit. The Special Use Permit currently covers licensee responsibilities for the site policing, maintenance, monitoring, and law enforcement at recreation facilities, including: Vermilion Campground, the Edison Lake Boat Launch, the Boat Launch dispersed camping area and the Edison Lake Vista Overlook. The costs shall be escalated based on the U.S. Gross Domestic Product – Implicit Price Deflator (GPD-IPD).

The Licensee shall contribute annually by October 1, \$5,500 (year 2002 cost basis) to the Forest Service for site policing, maintenance, monitoring, and enforcement of dispersed public use sites (overnight camping and day use) within the Project area around Lake Thomas A. Edison. The costs shall be escalated based on the GDP-IPD. The Licensee shall provide a boat and operator at least once each season (time to be determined by mutual agreement between the Licensee and the Forest Service) for the Forest Service to perform the site policing.

After facility reconstruction, project related recreation facilities are to be included within the FERC Project boundary.

### **Construction Responsibilities**

The licensee shall be responsible for funding and performing construction and future rehabilitation of all recreation facilities located within the Project boundary. Rehabilitation is normally needed every 15-25 years and is defined as work that is necessary to keep existing facilities (currently: Vermilion Campground, the Edison Lake Boat Launch and dispersed camping area; and the Vista Overlook) in serviceable condition to meet Forest Service standards.

All recreation facilities installed shall be designed and constructed according to Forest Service specifications and standards in place at the time of construction. This includes compliance with Forest Service Manual Direction concerning Forest Service Outdoor Recreation Accessibility Guidelines and the Forest Service Trails Accessibility Guidelines.

In all Licensee responsible construction, the licensee shall meet Americans with Disabilities Act (ADA) guidelines to maximize accessibility as Forest Service policy directs at the time of facility design and as determined feasible by the Forest Service. The Forest Service may approve modifications to this condition depending on topography, vegetation, feasibility, practicality, and the design standards current during project design and construction.

The licensee in consultation with the Forest Service will develop a schedule for the construction of all proposed recreation improvements in this license. The following recreation facilities are to be constructed by the Licensee at the existing recreation sites listed below. The Licensee in consultation with the Forest Service will develop the campground construction designs for Forest Service approval. This schedule will consider the timing and construction needs of other licenses within the Big Creek basin.

### **Vermilion Campground**

The Licensee shall conduct the following activities at the existing 31-unit campground:

1. Improve the leveling at all 31 of the existing campsites and a RV host site. The campsite upgrades shall consist of leveling an area of approximately 30 by 35 feet (1,050 square feet) at each campsite by removing ground obstacles (such as small rocks and roots), compacting the native surface, and constructing a minimum 26 inch wide and maximum 5-foot-wide compacted

- native surfaced pathway from the parking spur to the campsite. Running Slope of pathways shall not exceed 10 percent per 50 feet. Lengths of pathways will vary from 5 to 100 feet.
2. At all 31 campsites install a fire ring and replace the existing tables. Provide and install 31 bear proof food storage containers.
  3. Improve the parking spurs at all 31 campsites and the host site, and surfacing the native surface with 4 inches of compacted aggregate base rock. The length of the spurs will vary depending on topography and vegetation.
  4. Improve the delineation of the interior road, turnouts, and parking spurs by installing rock or post barriers for vehicle control, as determined feasible by the Forest Service. Resurface the interior campground road and parking spurs, and construct a parking turnout (approximately 8 feet wide by 40 feet long) adjacent to the roadway at each new toilet location.
  5. Reconstruct the existing interior roadway within the campground by repairing damaged areas, reconstructing the drainage ditches, replacing existing corrugated metal pipes with larger pipes, and resurfacing the entire roadway with compacted asphalt concrete paving.
  6. Replace 31 campsite markers and provide appropriate directional signs ("one way") as approved by the Forest Service.
  7. Provide erosion control on the campground access road and interior pathways as needed.
  8. Install 5 bear proof 4-yard garbage bins mounted on concrete pads. Pads will be placed adjacent to the main campground access road.
  9. Replace all faucets controls with self-closing, water-saving, lever controls. Provide for a level and paved surface in front and on both sides of the faucets units (minimum width of 3 feet on each side of faucet.) Replace the cover for the water system control valve.
  10. Install four new information station sign panels according to Forest Service design. Surface the viewing area in front of the signs with compacted aggregate base rock.

11. Remove and replace the existing pit toilets with four single-unit prefabricated concrete accessible vault toilets.
12. Provide a 5-foot-wide access pathway down the slope between the campground roadway and Lake Thomas A. Edison. Compact the pathway with aggregate base rock. The pathway shall extend to the high water line and may require steps, a bridge and a handrail.
13. The Licensee shall construct additional campsites as agreed by the Forest Service, when the seasonal occupancy rate from Memorial Day weekend through Labor Day weekend (inclusive) reaches 75 percent for 3 consecutive years, or as otherwise indicated by information provided in the Recreation survey and plan described elsewhere in this condition.

#### **Mono Creek Trailhead**

The Licensee shall consult with the Forest Service in the timing of the reconstruction of the Vermilion Campground facilities so as to coordinate the timing of Forest Service construction for the Mono Creek Trailhead with the construction at Vermilion Campground.

#### **Edison Lake Boat Launch**

The licensee shall modify the existing boat launch and expand the existing dispersed camping area:

1. Replace the existing boat launch surface material with a hardened surface. Width and length of the boat launch shall meet criteria acceptable to the California Department of Boating and Waterways and agreed upon by the Forest Service.
2. Construct up to 8 dispersed campsites at the entrance to the Boat Launch area. New sites will be located at least 300 feet from Lake Thomas A. Edison's high water mark. Units will consist of a level maximum 18-by 24 foot compacted native surfaced area with a 3-foot minimum and 5-foot maximum compacted native surfaced pathway to the unit from the road. The existing "informal" character of the area shall be maintained. The licensee shall identify appropriate traffic patterns. At each campsite, provide an accessible table, a bear-proof food storage container and a pedestal grill.

3. Improve the delineation of the parking and the boat launch road with rock barriers for vehicle control.
4. Install two 4-foot by 4-foot information panels in the parking lot that are consistent with Forest Service approved design. The panels will display day use area information, rules, and regulations.
5. Install one 4-yard bear-proof garbage dumpster near the turnaround area for the boat launch road. Containers shall be mounted on a concrete pad.
6. Remove and replace the existing pit toilets with two single-unit prefabricated concrete accessible vault toilets.
7. Install one accessible boat-loading platform. Platform design will be approved by the Forest Service.
8. Improve the delineation of the interior road and parking spurs by installing rock barriers for vehicle control, as determined feasible by the Forest Service.

#### **Edison Lake Vista Overlook**

The licensee shall modify the Vista Overlook:

1. At the Overlook, grade and level the area and surface it with compacted aggregate base.
2. Remove and replace the existing pit toilets with one single-unit prefabricated concrete accessible vault toilets.
3. Around the rock monument, remove the barrier poles and replace with 3-foot tall rock pillars and chain barriers to blend with the area.
4. Install two interpretive signs with mounting similar in color, texture and materials as the rock pillars surrounding the rock monument.

5. Licensee shall design with Forest Service approval, an interpretive sign for the overlook. The sign will complement the interpretive theme for the area and will highlight one or more outstanding features viewed from the overlook.
6. Construct a parking turn out at the toilet location. There will be a 5-foot native surface compacted accessible pathway from the parking turnout to the toilet door. The pathway grade shall meet the accessibility guidelines in place at the time of construction design.

### **Condition No. 15:- TRANSPORTATION SYSTEM**

#### **A. Transportation System Management Plan**

Licensee shall file with the Commission, within one year following the issuance of a new project license, a Transportation System Management Plan, approved by the Forest Service, for protection and maintenance of roads associated with this license. At a minimum the Plan should include a map showing all roads associated with this project, identify the uses (i.e. recreation, facility access) of the roads, condition surveys, construction/reconstruction needs, road closure, safety, jurisdiction (i.e., county, state), and identify roads with respect to the project boundary and maintenance responsibilities.

The Licensee shall, in consultation with the Forest Service, take appropriate measure to rehabilitate existing erosion damage and minimize further erosion of the Project access roads on National Forest System lands. Gates or other vehicle control measures will be installed where necessary to achieve erosion protection.

#### **B. Project Access Roads**

When construction is in progress adjacent to or on Forest Service controlled roads open to public travel, Licensee shall furnish, install, and maintain, temporary traffic controls to provide the public with adequate warning and protection from hazardous or potentially hazardous conditions associated with the Licensee's operations. Device must be appropriate to current conditions and must be covered or removed when not needed. Except as otherwise agreed, flagmen and devices must be as specified in the "Manual on Uniform Traffic Control Devices for Streets and Highways."

As part of transportation system management, the Licensee shall provide the following public safety and erosion control projects:

- Evaluate the Onion Springs Road from Vermilion Dam to the Warm Creek crossing to identify locations where road conditions present a hazard to public safety or where roads usage is resulting in excessive erosion. Licensee shall contribute to the reconstruction and stabilization of the Onion Springs Road based on a commensurate share of project-induced traffic.
- Evaluate the Kaiser Pass Road from the road crossing at the South Fork San Joaquin River to the Vermilion Overlook. Based on a commensurate share of project-induced traffic, the licensee shall contribute to the USFS, a percentage of the cost for reconstruction and/or stabilization. This would include construction of additional turnouts for user safety.

### **C. Area Access**

The United States shall have unrestricted use of any road constructed within the project area for all purposes deemed necessary or desirable in connection with the protection, administration, management, and utilization of Federal lands or resources. The United States shall have the right to extend rights and privileges for use of the right of way and road thereon to States and local subdivisions thereof, as well as to other users, including members of the public, except contractors, agents and employees of the Licensee. The agency having jurisdiction shall control such use so as not unreasonably to interfere with use of the road by the Licensee or cause the Licensee to bear a share of the cost of maintenance greater than the Licensee's use bears to all use of the road.

### **D. Road Use**

The Licensee shall confine all project vehicles, including but not limited to administrative and transportation vehicles and construction and inspection equipment, to roads or specifically designed access routes. The Forest Service reserves the right to close any and all such routes where damage is occurring to the soil or vegetation, or if requested by Licensee, to require reconstruction/construction by the Licensee to the extent needed to accommodate the Licensee's use. The Forest Service agrees to provide notice to the Licensee and the FERC prior to road closures, except in an emergency, in which case notice will be provided as soon as practicable.

## **Condition No. 16 – LAND RESOURCE PLANS FOR MITIGATING PROJECT EFFECTS TO NFS RESOURCES**

Within the timeframes described below, and in consultation with applicable Federal and State agencies, the Licensee shall file with the Commission Land Resource Plans that are approved by the Forest Service, as they relate to resource management on the National Forest. The plans shall include:

- A. Fire Management And Response Plan
- B. Visual Management Plan
- C. Sign Plan
- D. Hazardous Substance Plan

### **A. Fire Management and Response Plan**

Within six months of license issuance the Licensee shall file with the Commission a Fire Management and Response Plan developed in consultation with the Forest Service, California Department of Forestry and Fire Protection, and Kern County Fire Department. At a minimum the plan shall address the following categories:

- 1) Fuels treatment/Vegetation Management
  - Identification of fire hazard reduction measures to prevent the escape of project-induced fires.
- 2) Prevention
  - Availability of fire access roads, community road escape routes, helispots to allow aerial firefighting assistance in the steep canyon, water drafting sites and other fire suppression strategies.
  - Address fire danger and public safety associated with project induced recreation, including fire danger associated with dispersed camping, existing and proposed developed recreation sites, trails, and vehicle access.
- 3) Emergency response preparedness
  - Analyze fire prevention needs including equipment and personnel availability.
- 4) Reporting
  - Licensee shall report any project related fires to the Forest Service as soon as practicable.

- 5) Fire control/extinguishing
- Provide the Forest Service a list of the location of available fire suppression equipment and the location and availability of fire suppression personnel.

Include appropriate measures from the Vegetation Management Plan condition and assure fire prevention measures will meet water quality BMP's. Upon Commission approval, the Licensee shall implement the plan.

### **B. Visual Management Plan**

Within 1 year of license issuance, the Licensee shall file with the Commission a Visual Management Plan that is approved by the Forest Service for any NFS lands that are visually affected by the Project based on applicable FS visual standards and guidelines. As a minimum the Plan shall address:

- Clearings, spoil piles, and project facilities, such as diversion structures, penstocks, pipes, ditches, powerhouses, other buildings, transmission lines, corridors, and access roads.
- Facility configurations, alignments, building materials, colors, landscaping, and screening.
- An Implementation schedule to bring the project facilities into compliance with applicable National Forest Land and Resource Management Plan direction.
- Mitigation measures that shall include, but are not limited to:
  - Surface treatments with colors and materials that are in harmony with the surrounding landscape.
  - Use of native plant species to screen facilities from view, where appropriate.
  - Reshaping and revegetating disturbed areas to blend with surrounding scenic characteristics.
  - Removal of project induced debris piles that detract from the visual quality.
  - General maintenance and upkeep of facilities.

Upon Commission approval, the Licensee shall implement the plan.

### **C. Sign Plan**

The Licensee shall prepare in consultation with the Forest Service, Caltrans, Corp of Engineers, Kern County, and other interested parties, within one year of license issuance, a Sign Plan that shall conform to the Manual of Uniform Traffic Control Devices, Forest Service sign handbook, and other applicable standards. As a minimum the Plan is to include the location, design, size, color, and message for the following types of signs:

- Information and education signs
- Fire Prevention signs
- Regulatory and warning signs
- Project license signs
- Road signs
- Recreation signs
- Directional signs to assist non-local visitors
- Safety signs
- Sign format/consistency throughout project

The Plan shall also address maintenance standards so that all signs are maintained in a neat and presentable condition. Signs which are to be placed on National Forest System lands shall be approved by the Forest Service. The Licensee shall not be required to consult or obtain the prior approval of the Forest Service for signs on Licensee owned land that are not visible from National Forest System lands.

Upon Commission approval, the Licensee shall implement the plan.

### **D. Hazardous Substance Plan**

Within one year following the date of acceptance of this license and at least 60 days before starting any activities the Forest Service determines to be of a land-disturbing nature on National Forest System land, the Licensee shall file with the Commission, a plan approved by the Forest Service for oil and hazardous substances storage and spill prevention and cleanup.

At a minimum, the plan must require the Licensee to: (1) maintain in the project area, a cache of spill cleanup equipment suitable to contain any spill from the project; (2) to periodically inform the Forest Service of the location of the spill cleanup equipment on National Forest System land and of the location, type, and quantity of oil and hazardous substances stored in the project area; and (3) to inform the Forest Service immediately of the nature, time, date, location, and action taken for any spill.

### **Condition No. 17 - VEGETATION AND NOXIOUS WEED MANAGEMENT PLAN**

Within two years of license issuance, the Licensee shall file with the Commission a vegetation and noxious weed management plan developed in consultation with the Fresno County Agricultural Commissioner and California Department of Food and Agriculture.

At a minimum, the plan should include two components: a Noxious Weed Plan and a Vegetation Management Plan. Noxious weeds will be those weeds defined in the California Food and Agriculture code, and other species identified by the Forest Service.

- 1) The Noxious Weed Plan will include and address the following elements:
  - Noxious weed treatment (aquatic and terrestrial) within the project boundary and adjacent to project features including recreation facilities, roads, and distribution and transmission lines.
  - Inventory and mapping of new populations of noxious weeds using a Forest Service compatible database and GIS software. The Noxious weed GIS data layer will be updated periodically and shared with resource agencies.
  - Action and/or strategies to prevent and control spread of known populations or introductions of new populations, such as vehicle/equipment wash stations.
  - Develop a schedule for eradication of all A, B, Q and selected other rated invasive weed species, designated by resource agencies.
  - New infestations of A& B rated weeds shall be eradicated within 12 months of detection. (A, B, C, & Q ratings refer to the California Department of Food & Agriculture Action Oriented Pest Rating System).
  - At specific sites where other objectives need to be met (e.g. recreational use) all classes of noxious weeds may be required to be treated.
  - On-going annual monitoring of known populations of noxious weeds for the life of the license in locations tied to Project actions or effects, such as road maintenance, at project facilities, O&M activities, recreational areas, new construction sites, etc. to evaluate the effectiveness of re-vegetation and noxious weed control measures.

- Monitoring will be done in conjunction with other project maintenance and resource surveys, so as not to require separate travel and personnel. Monitoring information, in database and GIS formats, will be provided to the Forest Service as part of the annual consultation on affected National Forest resources (Condition No. 1). To assist with this monitoring requirement, training in invasive plant identification will be provided to Project employees and contractors by the Forest Service.
  - Licensee shall restore/revegetate areas where treatment has eliminated noxious weeds in an effort to eliminate the reintroduction of noxious weed species.
  - Project-induced ground disturbing activities shall be monitored annually for the first 3 years after disturbance to detect and map new populations of noxious weeds.
  - The plan will include an adaptive management element to implement methods for prevention of aquatic noxious weeds, as necessary. These actions may include, but may not be limited to: 1) public education and signing of public boat access, 2) preparation of an Aquatic Plant Management Plan approved by the Forest Service, and in consultation with other agencies, and 3) boat cleaning stations at boat ramps for the removal of aquatic noxious weeds.
- 2) The Vegetation Management plan shall include and/or address the following elements:
- Hazard tree removal and trimming;
  - Powerline/transmission line clearing;
  - Vegetation management for habitat improvement
  - Revegetation of disturbed sites;
  - Soil protection and erosion control, including use of certified weed free straw; and
  - Establishment of and/or revegetation with culturally important plant populations.
  - Use clean, weed free seed with a preference for locally collected seed.

Upon Commission approval, the Licensee shall implement the plan.

### **Condition No. 18- CULTURAL RESOURCES MANAGEMENT PLAN**

The licensee shall develop and implement the Cultural Resources Management Plan attached to the Project Memorandum of Agreement submitted to the Advisory Council on Historic Preservation.

**Condition No. 19-COORDINATION WITH PROJECTS IN THE BIG CREEK SYSTEM**

The Forest Service reserves the right, after notice and opportunity for comment, to require changes in the project and its operation through revision of the 4(e) conditions base on the results of the Basin Wide Big Creek Analysis and the relicensing efforts for Big Creek Hydropower Projects Nos. 67, 120, 2085, 2086, 2174, and 2175.

**Condition No. 20 - FOREST SERVICE RESERVES THE RIGHT TO REVISE SECTION 4(e) CONDITIONS IN RESPONSE TO OTHER AGENCIES REQUIREMENTS**

The Forest Service reserves the right to modify these conditions, if necessary, to respond to modifications required by 1) the U.S. Fish and Wildlife Service biological opinion issued for the relicensing of the Vermilion Valley project; and 2) the water quality certification issued by the State of California Department of Water Resources Control Board.