STATE OF CALIFORNIA

STATE WATER RESOURCES CONTROL BOARD

In the Matter of Permits 11966, 11967, 11968, 11969, 11970, 11971, 11973, 12364, 12365, 12720, 12721, 12722, 12723, and 12724, and Licenses 9956 and 9957, on Permitted Applications 5625, 5626, 5627,5628, 9363, 9364, 9365, 15374,15375, 15376, 16767, 17374, 17375, and 17376, and on Licensed Applications 10588 and 15424 of UNITED STATES BUREAU OF RECLAMATION	)	ORDER: WR 90-5

ORDER SETTING TERMS AND CONDITIONS
FOR FISHERY PROTECTION AND
SETTING A SCHEDULE FOR COMPLETION OF TASKS

BY THE BOARD:

1.0 INTRODUCTION

Notice of public hearing having been given to consider specified issues and proposed terms and conditions for the maintenance of water quality in the Sacramento River below Shasta Dam, Keswick Dam, and the Spring Creek Power Plant; a public hearing having been held on February 13 and 14, 1990; the Board having considered all the evidence in the record; the Board finds and concludes as follows:

2.0 BACKGROUND

The purpose of this proceeding is to consider enforcing certain water quality objectives in the upper Sacramento River, which are contained in the Water Quality Control Plan (Basin Plan) adopted by the Regional Water Quality Control Board for the Central Valley Region (Regional Board). This proceeding is also an action to enforce the requirements of Cal. Const. Art. X, Section 2, Water Code Section 275, and the Public Trust Doctrine.

2.1 Hydrologic Situation

The United States Bureau of Reclamation (Bureau) operates the Shasta Unit of the Central Valley Project. Shasta Dam impounds Shasta Lake, with a storage capacity of 4.5 million acre-feet. The Sacramento, Pit, and McCloud Rivers and a number of creeks within the 6,700 square-mile watershed feed the reservoir. Releases from Shasta Dam, as well as Trinity River diversions released through the Spring Creek Power Plant, are impounded briefly behind Keswick Dam, about nine miles downstream of Shasta Dam, before release into the upper Sacramento River.

The operation of Shasta Dam affects downstream water quality. In some years, during late summer and fall, releases from the upper levels of Shasta Lake, where

the water has been heated by the sun during storage, have caused river water temperatures to exceed the levels necessary to protect the fishery in the upper Sacramento River.

2.2 Impacts on Salmon

Chinook salmon hatched in the upper Sacramento River spend most of their lives in the ocean (2-4 years), returning to the river to reproduce. Adult salmon die after spawning. There are four races or runs of Chinook salmon in the upper Sacramento River, which spawn at different times of the year. Only salmon reared in the Sacramento River system return to the Sacramento River to spawn. The populations of all four races have declined during the past twenty years, with the winter run having declined to the point where it has been listed as endangered or threatened under both the state and federal endangered species acts. The reach of the Sacramento River between Keswick Dam and the Red Bluff Diversion Dam was designated as critical habitat under the federal act.

The temperature of the water is critical to salmonid spawning and egg incubation. Substantial mortality to the eggs occurs at temperatures above 56°F. During normal water years in the period between 1970 and 1986, daily average water temperatures in the upper

Sacramento River exceeded 56°F from July through October about 40 percent of the time, although they did not exceed 60°F. In critically dry years, daily average temperatures exceeded 56°F nearly 80 percent of the time, and exceeded 60°F nearly 60 percent of the time. The high temperatures have substantially contributed to the decline in the fishery population.

2.3 Thermal Control of the River

The temperature of releases from Shasta Dam can be controlled by selecting the depth from which the released water is taken. Deeper water is cooler. The difference in temperature between surface water and deeper water is greatest in the summer and early fall. Water near the surface is heated by the sun, and this warmer, less dense water stays on top. Shasta Lake is large and deep enough that it becomes thermally stratified -- with no mixing between the upper layer and cooler water below. Later in the year, surface water cools, the waters of the reservoir mix, and the temperature difference between surface and deeper water is not as great.

Shasta Dam has outlets at 742, 815, 842, and 942 feet above sea level. The spillway crests at 1,065 feet above sea level. Only the outlets at 815 feet are

connected to the powerhouse. In the summer and fall of a normal year, water drawn through these outlets comes from the middle layer of the reservoir, with temperatures ranging from about 46°F to 53°F. In some years, primarily during years of low precipitation, reservoir levels drop to the level where water drawn through the 815-foot elevation outlets comes from the upper, warmer layer, with temperatures in excess of 60°F. Studies by the Bureau predict that as water deliveries increase, these warmer temperature conditions will occur more frequently. Shasta Dam could be modified to permit releases through the 815-foot elevation outlets to be drawn from colder water at lower levels. The Bureau can also maintain cooler river temperatures before any modifications are designed and installed by releasing deeper water through the lower, 742-foot level outlets, but making these releases results in a loss in power generation.

2.4 Basin Plan Objectives

The Basin Plan sets a water quality objective to protect the fishery in the Sacramento River from Keswick Dam to Hamilton City. The water quality objective provides, in pertinent part:

> "[t]emperature shall not be elevated above 56°F in the reach from Keswick Dam to Hamilton City...." (State Board and

> Central Valley Regional Board, Water Quality Control Plan Report: Sacramento River Basin (5A), Sacramento-San Joaquin Delta Basin (5B), San Joaquin Basin (5C).)

The Basin Plan also sets objectives for dissolved oxygen (9.0 mg/l in the Sacramento River from Keswick Dam to Hamilton City between June 1 and August 31), and turbidity (limiting incremental increases in turbidity).

These objectives apply to controllable water quality factors, not to uncontrollable factors. "Controllable water quality factors" are defined in the Basin Plan as

> "... those actions, conditions, or circumstances resulting from human activities that may influence the quality of the waters of the State, that are subject to the authority of the State Board or the Regional Board, and that may be reasonably controlled." (Revised Region 5 Basin Plan for Basins 5A, 5B, and 5C as approved by the State Board on March 22, 1990.)

The temperature objectives have been violated, and further violations are threatened.

2.5 <u>Enforcement Authority</u>

Pursuant to Water Code Section 1258, the Board may subject appropriations to such terms and conditions as it finds are necessary to carry out basin plans. The Board has authority under Water Code Section 275 and

under the Public Trust Doctrine to amend existing water right permits and licenses to prevent waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion of water and to protect public trust uses of water. United States v. State Water Resources Control Board (1986) 182 Cal.App.3d 82, 227 Cal.Rptr. 161; National Audubon Society v. Superior Court (1983) 33 Cal.3d 419, 189 Cal.Rptr. 346. The Board is exercising that authority in this order.

The Board decided to consider exercising its water right authority in this case after it reviewed the waste discharge requirements which the Regional Board for the Central Valley Region adopted on March 24, 1988 for Shasta Dam, Keswick Dam, and the Spring Creek Power Plant. The waste discharge requirements specified receiving water limitations for temperature, turbidity, and dissolved oxygen. The requirements included a time schedule for the Bureau to evaluate and make necessary modifications to Shasta Dam and Spring Creek Power Plant for the control of water temperature releases from these facilities. In Order No. WQ 89-18, the Board found that the water quality problems caused by releases from Shasta Dam and related facilities could best be regulated through modification of the water

right permits and licenses of the Bureau. At an April 10, 1989 State Board workshop, Bureau assured the State Board that the Bureau would not contest the establishment of appropriate water quality control requirements, addressing the same issues as the waste discharge requirements issued by the Regional Board, if the State Board adopted those requirements pursuant to its water rights authority. The State Board accordingly remanded the waste discharge requirements to the Regional Board for further proceedings consistent with Order No. WQ 89-18. The Bureau reiterated its stipulation in its letter dated October 16, 1989, saying,

> "... the Bureau will not contest establishment by the State Board of modifications to the permits for Shasta Dam, Keswick Dam, and Spring Creek Power plant, to set appropriate conditions to maintain water quality in the upper Sacramento River under its water rights authority."

On December 8, 1989, the Regional Board rescinded the waste discharge requirements and waived waste discharge requirements for releases from Shasta Dam, Keswick Dam, and the Spring Creek Power Plant, conditioned upon the Bureau's compliance with water right orders and the Bureau's stipulations.

The regulation of water rights in this case is the Board's principal enforcement mechanism to control releases from the Bureau's water supply facilities, where those releases violate or threaten to violate water quality objectives. Consequently, we are in this case enforcing the objectives through amendments to the Bureau's permits and licenses.

3.0 ISSUES IN THIS PROCEEDING

We listed seven issues in our hearing notice, upon which we required evidence. These were:

1. Should the State Board add the terms and conditions set forth in the Notice to the subject permits and licenses to maintain water quality in the Sacramento River below Shasta Dam, Keswick Dam, and the Spring Creek Power Plant?

2. What will be the effect of the proposed amendment of the subject permits and licenses on public trust uses and on the prevention of waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion?

3. Should the proposed terms and conditions be revised?

4. Should additional terms and conditions be added to the subject permits to protect public trust uses and to prevent waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion?

5. Should existing bypass terms and conditions in the subject permits and licenses be amended to protect water quality in the Sacramento River below Keswick Dam?

6. Should a term or condition setting forth a specific time schedule for construction and implementation of temperature control modifications to Shasta Dam be added to Permits 12720, 12721, 12722, 12723, and 12724?

7. Should a term or condition setting forth a specific time schedule for evaluation, possible construction, and implementation of temperature control modifications to the Spring Creek Power Plant be included in Permits 11966, 11967, 11968,

11969 11970, 11971, 11973, 12364, and 12365 and License 9957? This issue shall be restricted to the Spring Creek Power Plant and its effect on the Sacramento River.

With regard to issues 1 through 4, the Board's staff offered proposed terms and conditions for discussion at the hearing, as follows:

"TABLE II

"PROPOSED TERMS AND CONDITIONS

"1. Permittee[1] shall control releases from Shasta Dam, Spring Creek Power Plant and Keswick Dam so as not to allow the average daily water temperature of the Sacramento River in the reach between Keswick Dam and Hamilton City to exceed 56°F during periods when temperature increases will be detrimental to the fishery.[2]

"

1 Permittee and Permit will be replaced with Licensee and License for those terms and conditions included in Licenses 9957 and 9956.

2 This term is consistent with the Water Quality Control Plan objective. Regional Board Order No. 88-043 limited this requirement to the reach of the Sacramento River between Keswick Dam and the Red Bluff Diversion Dam. Evidence is expected to be received during the hearing on the scope of this term.

"2. Permittee shall control releases from Shasta Dam, Spring Creek Power Plant and Keswick Dam so as not to allow the dewatering of salmonid redds or stranding of young salmon in the Sacramento River in the reach between Keswick Dam and the Red Bluff Diversion Dam during the months of October through January.

"3. Permittee shall ensure that releases from Shasta Dam and the Spring Creek Power Plant will not increase the turbidity of Keswick Reservoir or the downstream Sacramento River by more than the following:

a) 20 percent when the mean turbidity of the Sacramento, Pit, and McCloud Rivers upstream of Shasta Lake is between 0 and 50 Nephelometric Turbidity Units (NTU).

b) 10 NTU when the mean turbidity of the Sacramento, Pit, and McCloud Rivers upstream of Shasta Lake is between 50 and 100 NTU.

c) 10 percent when the mean turbidity of the Sacramento, Pit, and McCloud Rivers upstream of Shasta Lake is greater than 100 NTU.

"4. Permittee shall ensure that releases from Shasta Dam, Keswick Dam and Spring Creek Power Plant do not depress the dissolved oxygen of the Sacramento River from Keswick Dam to Hamilton City below 7.0 mg/l at any time nor below 9.0 mg/l from June 1 to August 31. When natural conditions lower the dissolved oxygen below 9.0 mg/l in this reach and time period, the permittee shall ensure that releases do not depress the dissolved oxygen concentration of the Sacramento River below 95% of saturation.

"5. Permittee shall comply with the following provisions which are derived from the cooperative agreement to implement actions to benefit winter run Chinook Salmon in the Sacramento River Basin between permittee and California Department of Fish and Game, National Marine Fisheries Service, and United States Fish and Wildlife Service executed on May 20, 1988 and filed with the State Water Resources Control Board:

a) Permittee shall continue to raise all the gates at the Red Bluff

Diversion Dam from December 1 to April 1, annually, to the full open position to allow passage of upstream migrating winter run Chinook Salmon. The permittee may lower the gates during this period if agreed to by the National Marine Fisheries Service.

b) Permittee shall develop, fund and implement structural and/or operational solutions to winter run Chinook Salmon water temperature control problems associated with operations to Shasta Dam. This will include installation of a device in Shasta Reservoir to control the ranges of depth of water withdrawals. Other measures, including cold water releases from Shasta Dam, shall be taken, where practicable, to control water temperature prior to the installation of the device.

c) Permittee shall develop the water management portion of the Spring Creek pollution control program.

d) Permittee shall continue to modify the Keswick fish trap as necessary to prevent mortality to winter run Chinook Salmon.

e) Permittee shall fund, develop, and implement studies to identify additional management actions to improve the status of winter run Chinook Salmon in the Sacramento River Basin.

Inclusion in this permit of certain provisions of the agreement shall not be construed as disapproval of other provisions of the agreement or as affecting the enforceability, as between the parties, of such other provisions insofar as they are consistent with the terms of this permit.

"6. Permittee shall immediately notify the Chief of the Division of Water Rights of any updates or modifications to the cooperative agreement, and notify the Chief of the Division of Water Rights at least ninety (90) days in advance of the expiration or termination of the cooperative agreement. Expiration, amendment, or termination of the cooperative agreement shall not by itself affect the meaning of enforceability of term 5 above.

"7. Permittee shall not increase the total annual diversion from the Trinity River for purposes of upper Sacramento River temperature control.

"8. Permittee shall not modify its Trinity River operations for water temperature control on the Sacramento River in such a manner as to adversely affect salmonid spawning in the Trinity River.

"9. Permittee shall comply with the following time schedule for installation of a device in Shasta Reservoir to control temperature releases from Shasta Dam.

Task		Completion
Design and Construction	NEPA Document	Date
	Draft	May 1990
Design		Sept. 1990
	Final	Nov. 1990
Award Construction Contract		March 1991
Construction		Dec. 1992

"10. Permittee shall give the Chief of the Division of Water Rights five days advance notice if, for any reason, it will not meet Permit Terms 1, 2, 3, 4, 7, 8, and 9 above.

"11. The Chief of the Division of Water Rights shall require permittee to conduct reasonable monitoring and reporting to ensure that Terms 1, 2, 3, 4, 7, 8, and 9 above are complied with. Permittee may, upon notice to all interested parties, petition the State

Board to review any monitoring or reporting requirement imposed under this delegation.

"12. The State Board retains continuing authority to amend any term or condition of this permit after notice and opportunity for hearing."

4.0 PARTIES PRESENTING EVIDENCE AND POSITIONS

In addition to the Bureau, which is the affected water right holder in this proceeding, we received evidence and comments from representatives of the following organizations:

U. S. Fish and Wildlife Service
California Department of Fish and Game
National Marine Fisheries Service
California Department of Water Resources
Central Valley Project Water Association
Association of California Water Agencies
Trinity County
Hoopa Valley Tribe

In addition, we received policy statements from the following organizations:

Regional Water Quality Control Board for the North Coast Region
Tehama-Colusa Canal Authority and Water Users Association
California Sport Fishing Protection Alliance
State Water Contractors and Kern County Water Agency
Metropolitan Water District
Salmon and Steelhead Advisory Committee
Central Valley Project Customer Technical Committee

5.0 DISCUSSION

The following discussion covers each of the issues raised in the notice and each type of term or condition that was raised for consideration.

5.1 Requests for Postponement of Permanent Terms and Conditions

Before the hearing, we received two requests for postponement of the hearing, from the United States Department of the Interior and from the Central Valley Project Water Association. Both parties argued that they needed more time to fully analyze the effects of the terms and conditions proposed in our notice of public hearing, and requested a 60-day postponement. Because of the urgency of ensuring that the fishery has protections for this year, the Chief of the Division of Water Rights declined to postpone the hearing. Thereafter, the United States Bureau of Reclamation, the National Marine Fisheries Service, the United States Fish and Wildlife Service, and the California Department of Fish and Game jointly developed a set of interim terms and conditions which the Bureau proposed to the Board as USBR Exhibit 21. The Bureau proposed that the Exhibit 21 conditions be interim, to be replaced by permanent terms and conditions by December 31, 1990. The four parties proposed to

develop and present to the Board by September 30, 1990 a proposal for permanent permit terms and conditions, with supporting data. After having considered all of the evidence, we believe that a further hearing may be helpful. It would allow the parties to provide further analysis of the needed terms and conditions and of their effects on both the environment and on other beneficial uses of water. This information may help us to determine how the terms and conditions can be improved. Although a further hearing might provide useful information, a need exists to act promptly to protect the fishery, and we have adequate evidence in the record at this time to adopt certain terms and conditions. These terms and conditions are adopted with the proviso that we will give the parties an opportunity to present further evidence and further analysis of the terms and conditions, and that we will reserve jurisdiction to make any necessary changes in these terms and conditions. We may hold a hearing on our own motion or at the request of the Bureau or any interested party. In particular, we will review the terms and conditions set by this order, and consider other terms and conditions within the scope of those which were proposed in our Notice of Public Hearing dated January 8, 1990, after the Bureau prepares and circulates a complete environmental document.

5.2 Upper Sacramento River Temperature Requirements

The 56° temperature objective in the Basin Plan establishes the temperature that will protect the fishery from adverse thermal effects during salmonid spawning and egg incubation. The releases from Shasta Dam and its related facilities are the primary controllable influence on the temperature of water in the affected reach. Climatic influence varies by season. The release of low temperature water into the upper Sacramento River helps provide conditions which replace those conditions which were available to the fishery upstream of Shasta Dam before the dam was constructed. This helps mitigate, in part, for the loss of the upstream spawning and rearing habitat.

The Basin Plan temperature objective applies from Keswick Dam to Hamilton City, but only to the extent that temperatures are controllable and higher temperatures would be detrimental to the fishery. Depending upon the amount of water in storage at Shasta, ambient air temperatures, tributary inflow, and possibly other factors, the Bureau's existing facilities often cannot control temperatures in the entire reach at 56° or less. For example, the Bureau must plan its releases so that it does not run out of cool water late in the season. It must also plan its

releases so that it will meet other applicable permit or license terms and conditions. Moreover, during some times of the year spawning salmonid adults or eggs do not occupy the entire affected reach. Because of these and other factors, it is necessary that the length of the reach to be protected be flexible. At the same time, we recognize that any shortening of the protected reach during the period when spawning salmon and eggs are present may limit the production of salmon. To maximize salmon production with a limited supply of water will require careful planning.

The Bureau proposed two interim terms and conditions as alternatives to Term 1 listed in our Notice of Public Hearing. Because of the need for flexibility in the farthest location where the Bureau will maintain 56°F, we will adopt a permit term which contains the flexibility and reporting requirements the Bureau recommends, together with a requirement that the Bureau consult with the fishery agencies before moving the compliance location upstream.

The term we adopt in this Order will require the Bureau to maintain the temperature in the reach of the Sacramento River between Keswick Dam and the Red Bluff

Diversion Dam at 56°F when (1) higher temperatures will be detrimental to the fishery, and (2) maintenance of 56°F in that reach is within the Bureau's reasonable control. Whether a particular factor is within the Bureau's reasonable control depends on the specific facts and is a matter for the Chief of the Division of Water Rights or the Board to decide, when the Bureau proposes changes in the location where it will meet the temperature requirement. Parties who believe that it is within the Bureau's reasonable control to meet the temperature requirement at a location different from the location the Bureau proposes, may so advise the Chief of the Division of Water Rights.

The Bureau is planning a temperature control device that it will construct on the upstream side of Shasta Dam. A temperature control device will be needed to ensure the maximum beneficial use of the water stored in Shasta Reservoir. It will give the Bureau access to water at lower reservoir levels to generate power, instead of bypassing the power inlet in order to release cold water. The general welfare of this state requires that water resources be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented. Cal. Const.

Art. X, Section 2. The Bureau's permits are conditioned as a matter of law upon compliance with this section. See, United States v. State Water Resources Control Board (1986) 182 Cal.App.3d 82, 227 Cal.Rptr. 161, 187. Thus, the Bureau must do whatever is reasonable to maximize the uses of the water available to it.

In this case, the Bureau has demonstrated that it can not only protect the fishery but also serve a full quota of other uses by constructing a device. The Bureau will forego the generation of millions of dollars worth of hydropower every year that reservoir levels are low and the Bureau does not have a device in place to channel water from the cooler, deep water of the reservoir through its power generators. In 1987 through 1989, the Bureau forewent approximately $6.4 million in power generation to meet its obligation to protect the fishery. While the Bureau's operations since 1987 may have been reasonable given the limitations of its current facilities, the fact that those facilities cannot withdraw water from the lower levels of the reservoir and generate power at the same time threatens to result in a violation of Cal. Const. Art. X, Section 2 if the Bureau does not act promptly to correct the situation. When reservoir levels are low, the Bureau can protect the fishery, but cannot

also use all of the water released from Shasta Dam to generate power. After a reasonable period to install a temperature control device, the situation in which the Bureau must forego power generation in order to protect the fishery can be avoided at a reasonable cost and without interfering with other project objectives. To prevent a violation of Cal. Const. Art. X, Section 2, the Bureau must promptly install a temperature control device. In order to provide additional clarity regarding the time within which the work should be completed, we will include a compliance schedule based on the evidence available in the hearing record. This schedule may be revised as a result of a further hearing.

Installation of a temperature control device also will be necessary for the Bureau to comply fully with the Basin Plan temperature objective. As planned, the Shasta Reservoir temperature control device would improve the Bureau's ability to control downstream temperature through water releases from Shasta Dam. This device will allow the drawing of warm water from the reservoir at appropriate times of the year to conserve cold water within the reservoir. It will also allow the drawing of cold water from lower elevations when necessary without bypassing the power plant. With the proposed system in place, the Bureau will get

access to 120,000 acre-feet of currently inaccessible cold water for selective use to protect the fishery during dry years. (T,I,35:18-25) This currently inaccessible pool is approximately equal to 2.7 percent of the reservoir's 4.5 million acre-foot capacity.

The Bureau's witness expressed the opinion that from an operations standpoint, the structure is needed today. Representatives of the U. S. Fish and Wildlife Service and the California Department of Fish and Game also testified to the importance and benefit of this structure for the upper Sacramento River fisheries management. (T,I,35:4-37:19,141:23-142:3,188:16-189:2) Use of a temperature control device would improve the control of temperatures downstream, allowing the Bureau to maintain a temperature of 56°F over a larger area, or for a longer period, than is feasible without the device. Based on the foregoing, we find that given a reasonable period of time for completing construction of the device, water temperatures in excess of 56°F which could reasonably be avoided if the device were in place and in use, are within the Bureau's reasonable control. Put another way, if the Bureau fails to install the device in accordance with a reasonable time schedule, and temperatures in excess of 56°F occur which could reasonably have been avoided through use of

the device, at a time when higher temperatures are detrimental to the fishery, the Bureau would violate the Basin Plan objective.

5.3 Dewatering of Salmonid Redds or Stranding of Young Salmon, and Minimum Flows

In our Notice, we presented a term directed toward preventing salmonid redds (nests) from dewatering or young salmon from stranding due to fluctuations in releases from the Bureau's facilities. We presented this term for consideration because salmon often put their redds in shallow areas, which can be dewatered if flows drop after the redds are constructed. If the redds are dewatered, the eggs or the newly hatched fish will die. The Bureau proposed that we substitute for our term two different terms, a ramping requirement for decreases in the release rate from Keswick Dam and a minimum flow requirement of 3250 cubic feet per second (cfs) from September through February.

The Bureau's permits currently require the minimum flows set forth in a "Memorandum of Agreement for the Protection and Preservation of Fish and Wildlife Resources for the Sacramento River as Affected by the Operation of Shasta and Keswick Dams and Their Related Works and Various Diversions Proposed Under Applications 5625, 5626, 9363, 9364, 9365, 9366, 9367,

9368, and 10588 of the United States" executed on April 5, 1960, by the United States and the Department of Fish and Game. The minimum flows set forth in the agreement to be bypassed or released into the natural channel of the Sacramento River at Keswick Dam are as follows:

January 1 through February 28	2600cfs
March 1 through August 31	2300cfs
September 1 through November 30	3900cfs
December 1 through December 31	2600cfs

In addition, the agreement contains a schedule providing for flow reductions in critical dry years.

The Bureau's proposal in USBR Exhibit 21 would set a minimum bypass or release of 3250 cfs during the period from September 1 through February 28. This is lower than the requirement for September 1 through November 30 and higher than the requirement for December 1 through February 28. In negotiating the proposed interim terms for USBR Exhibit 21, the three fishery agencies agreed to the 3250 cfs bypass or release during this period, and the Bureau's witness testified that the Bureau actually has operated in accordance with the 3250 cfs bypass or release since 1982, when the Department of Fish and Game requested it for the purpose of reducing the potential to dewater salmonid redds. We note that lowering the bypass or

release to 3250 cfs from September 1 through November 30 during the past 8 years was contrary to the Bureau's permits, and the Bureau should have requested the Board to change the permits. The Department of Fish and Game has no jurisdiction to revise a water right permit. Nevertheless, the overall change may be beneficial to the fishery.

The Bureau presented evidence which suggests that, under certain assumptions, the term presented in the Notice would require ever-increasing releases during the spawning season, to avoid dewatering any redds deposited during high flow events. The Bureau's assumptions and resulting analysis result in conclusions which may not be a necessary consequence of protecting redds from dewatering. The analysis should have taken into account biological information, which was not used in developing the analysis presented at the hearing. The Department of Water Resources and the Department of Fish and Game currently are conducting an on-site fishery study including a study of flows necessary to prevent dewatering. (T,I,185:20-186:12) The Bureau should incorporate in its analysis any available results of that study.

It would be helpful to have more information before setting a specific term to prevent dewatering of redds. The Bureau should propose further refinements for a long-term requirement to protect salmonid redds, and should analyze its effects. For now, we will adopt the substance of the Bureau's interim terms 5 and 6 (Exhibit 21); we may revise these terms after we conduct a further hearing pursuant to our reservation of jurisdiction.

5.4 Turbidity Requirements

In the Notice, the Board's staff proposed a permit term limiting turbidity increases due to releases from the Bureau's facilities to levels consistent with the Basin Plan objective for turbidity changes. The Bureau objected to this term being added at this time, pending a further analysis of whether the Bureau is able to control turbidity in accordance with the proposed permit term. The Bureau provided evidence that during some periods natural events may increase turbidity in Shasta Lake; releases could exceed the objective at the same time that releases are required for fishery protection or for flood control. Since turbidity varies at different levels in the reservoir, the temperature control device may be helpful to control turbidity in the releases. It will allow selection of

water for release from different levels. For the short term, we do not find the increases in turbidity due to natural events to be reasonably controllable by the Bureau, at least until the Bureau has had sufficient time to install a device which can be used to select the levels from which water is withdrawn from the reservoir. Consequently, we will give the Bureau more time to analyze this proposed permit term before we consider adopting it. If refinements are needed, the Bureau should propose them.

5.5 Dissolved Oxygen Requirements

In the Notice, the Board's staff proposed a permit term that would require that releases from the Bureau's facilities not depress the dissolved oxygen in the Sacramento River from Keswick Dam to Hamilton City below 7.0 mg/l at any time nor below 9.0 mg/l from June 1 to August 31. This requirement follows the Basin Plan objective. The Bureau objected to adoption of this term at this time because it had not had time to fully analyze its feasibility.

We have no evidence in the record that lack of dissolved oxygen has been a problem in the upper Sacramento River. Consequently, we will allow the Bureau more time to analyze this proposed term before

considering adopting it. If refinements specific to the Bureau's operations are needed, the Bureau should propose them and analyze them.

5.6 Cooperative Agreement Items

In the Notice, Board staff presented a proposed term that would require the Bureau to implement actions to benefit winter run Chinook salmon, as a condition of its permit and license terms and conditions. The proposed term was derived from a cooperative agreement dated May 20, 1988 between the Bureau, California Department of Fish and Game, the National Marine Fisheries Service, and the United States Fish and Wildlife Service. The language of the relevant portions of the agreement was modified somewhat to make it suitable as a permit term.

During the hearing we received evidence that formal consultation under Section 7 of the federal Endangered Species Act regarding the winter run Chinook salmon has been initiated. Also, the 1988 cooperative agreement will expire in 1992. The Section 7 consultation will likely cause substantial revisions in the Bureau's commitment, and may render some of the agreement's contents moot. Consequently, it would be premature

to impose this term at this time. The Bureau should provide an analysis of this term and of alternative terms.

5.7 Coordination Meetings

In its Exhibit 21, the Bureau proposed as interim term 7 a term that would require the Bureau to hold coordination meetings with fishery agencies to formulate operation plans to manage the fishery resources in the upper Sacramento River. The Bureau considers the proposed coordination meetings to be key to the success of the interim terms and conditions it recommended.

The proposed term itself requires work products and actions by the fishery agencies. We lack authority to direct the actions of these agencies. Through other terms and conditions we adopt in this order, we will require the crucial elements of the Bureau's term 7 -- that the Bureau consult with the fishery agencies when it makes its plans for operation pursuant to this order, and that the Bureau report to this Board. We will not adopt the Bureau's proposed interim term 7.

5.8 Avoiding Impacts on the Trinity River

Temperature control in the upper Sacramento River often is aided by diversions of cold water from the Trinity River. Because the Bureau can cool the Sacramento River with Trinity River water, concern exists that efforts to protect the upper Sacramento River fishery by adding quantities of cold water from the Trinity River will cause adverse thermal effects in the Trinity River, to the detriment of the Trinity River fishery.

We have already announced our intention to conduct a water right proceeding to consider whether the Bureau's Trinity River water rights should be modified to establish temperature limitations and other controls on water quality to protect the fishery in the Trinity River. See Order No. WQ 89-18. The proceedings on the Bureau's Trinity River water rights are expected to be commenced late this year.[1] Our hearing record for this decision is not adequate to set fishery protections for the Trinity River.

More importantly, we excluded from our Notice of Public Hearing consideration of Trinity River water quality

1 We have received from Trinity County a petition dated March 9, 1990, requesting a decision on the Bureau's Trinity River water rights by September 1990 or, alternatively, adoption in this order of thermal protections for the Trinity River fishery. We are separately reviewing the request for an earlier decision, and will respond to it shortly.

except to the extent that our protection of the upper Sacramento River fishery herein may adversely affect the Trinity River. Setting objectives specifically for the Trinity River fishery in this order could result in adverse environmental impacts on the Sacramento River, because of possible flow reductions or thermal problems. Consequently, we do not set comprehensive protections for the Trinity River fishery in this order; rather, our intention is to prevent or avoid any adverse effects to the Trinity River fishery as a result of the action herein to protect the upper Sacramento River fishery. We will adopt a term that is enforceable and narrowly tailored to carrying out our intention.

Three terms or sets of terms were considered at the hearing to fill this requirement. The Board's staff proposed two terms in the Notice. The Bureau proposed as interim term 9 the staff's term 8, and in addition proposed a term 10, which provides that the adopted terms would not be construed as interfering with the decision of the Secretary of the Interior dated January 14, 1981 regarding the Trinity River releases. The Department of Fish and Game, after having initially agreed to the Bureau's interim terms, proposed another term instead of Bureau's term 9. Fish and Game's

term 9 was more explicit and more enforceable than Bureau's term 9. However, it tended to protect the Trinity River fishery against thermal effects caused not only by the action herein, but also against unrelated actions by the Bureau. The Bureau's term 9, which is identical to the staff's term 8, states our intention, but is unclear and provides no means to ensure that it is implemented. Nor does it define its terms.

At the end of the hearing, the Chairman left the record open for 14 days, to allow the parties time to see if they could reach an agreement on a replacement term. Within the time allotted, the Department of Fish and Game revised its term 9 and obtained support for it from the other fishery agencies and the Hoopa Tribe, but did not obtain agreement from the Bureau or the other parties. We have reviewed it and find that it remains broader than necessary to avoid or prevent adverse effects on the Trinity River as a result of the action herein to protect the upper Sacramento River fishery. Consequently, we have revised it. The term adopted herein designates when and where thermal protection in the Trinity River should not be disrupted by this order. The term will implement the intent described in this finding and in our Notice.

5.9 Compliance Schedule

5.9.1 Shasta Reservoir Temperature Control Device

In the Notice, the Board's staff proposed a compliance schedule for the Bureau's installation of a temperature control device in Shasta Reservoir and for preparation of environmental documentation for the device. The Bureau opposed a specific time schedule and instead recommended two terms, which it listed as term 1 and term 8. Bureau's term 1 states a general intent that the Bureau and the fishery agencies will develop and present proposed permanent terms and conditions, with supporting data, by September 30, 1990, and that the Board will then schedule a hearing to adopt by December 31, 1990 permanent terms and conditions. Bureau's term 1 is similar to our intent herein, which is set forth in part 5.1 above. However, it is more suited to a finding than a permit term. Also, we are not in a position to direct the activities of the fishery agencies. Consequently, we will not include Bureau's term 1 as a permit term.

Bureau's term 8 would require the Bureau to pursue the construction of the temperature control device and improved fish passage facilities at Red Bluff Diversion Dam with all due diligence, but would not set a

completion date for these facilities. We routinely set dates for compliance in our water right orders and decisions to ensure that the requirements are completed within a reasonable period. Also, we believe that setting a completion date for the Shasta Reservoir temperature control device is important to demonstrate that construction of the device must proceed. Both the U. S. Fish and Wildlife Service and the Department of Fish and Game stressed the importance of early installation of the device. (T,I,38:20-39:5,141:23-142:3,188:16-189:12)

Regarding the schedule for completion of the temperature control structure, the Bureau testified that specific design of the structure is 35 percent complete. The final environmental documentation is scheduled for completion in December of 1990, and the actual construction should commence in March of 1991. A starting date for system operation is scheduled for December 1992. Although money has been allocated for design, construction is dependent upon Congressional appropriation of funds. (T,I,37:1-11)

The Board believes that the Shasta Reservoir temperature control device is extremely important for the protection of the upper Sacramento River fishery

and to maximize the Bureau's reasonable and beneficial use of the water. The Bureau's permits and licenses should be conditioned on a compliance schedule for constructing this structure. Because delays can be expected in a construction project of this size, the schedule allows for a one year addition to the Bureau's currently scheduled completion date. The extra year will allow for an additional construction period during the summer and fall months of low reservoir elevation. (USBR,11)

5.9.2 Construction Funding

During the hearing, the Bureau's witnesses were questioned about the possible sources of funding for the Shasta Reservoir Temperature Control Device, but had no answers. Because of the urgency of constructing the device, and our interest in monitoring its progress, we will require the Bureau to submit an analysis of alternative funding sources to the Board by September 30, 1990. This compliance date corresponds with the Bureau's proposed date to submit proposed permit terms and conditions for the permits and licenses herein. (T,I,40:2-17; USBR,21)

As a witness for the Bureau stated, it is difficult to find tax dollars to fund projects. It appears that

construction of the device may constitute part of operation and maintenance of the project, under 43 United States Code Section 492. Operation and maintenance expenses ordinarily are paid annually by the water users. Under 43 United States Code Section 504, expenses of operation and maintenance that are beyond the means of the water users may be deferred and scheduled in accordance with the repayment ability of the water users. See also 43 C.F.R. Section 426.13(5). The case law shows that expenses to construct facilities to

> "... remedy conditions brought about by the use of a completed water delivery system to maintain it as an efficient going concern or to operate it effectively for the end for which it is designed and to overcome injurious consequences arising from the normal and ordinary operation of the completed plant"

are properly chargeable to operation and maintenance. United States v. Fort Belknap Irrigation District (1961) 197 F.Supp. 812 (in a complex factual situation the court distinguished between expenses for construction and for operation and maintenance at Sherburne Dam), citing Nampa & Meridian Irr. Dist. v. Bond (1925) 268 U.S. 50, 45 S.Ct. 383 (a drainage system installed to overcome adverse effects of drainage onto areas adjacent to the service area was chargeable as an operation and maintenance expense);

United States of America v. Contra Costa Water District (1982) 678 F.2d 90 (construction of a retaining wall in the Contra Costa Canal to prevent a bank from collapsing was an operation and maintenance expense).

Finally, because this Order enforces state water quality objectives, Clean Water Act Section 313 requires federal agencies such as the Bureau to comply with state requirements respecting the control and abatement of water pollution. Water pollution is defined in Clean Water Act Section 502(19) as the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water. A presidential exception is required to justify failure to comply with a state requirement under Section 313. Lack of funding is not a basis for obtaining the exception unless Congress denies a request from the President for funding the work required to comply.

5.9.3 Schedule for Preparation of Environmental Documentation

We routinely require permittees to comply with our orders on a time schedule which specifies the important steps in the permittee's progress toward completion of required work. An important step in the Bureau's progress toward carrying out the matters ordered herein

is the Bureau's preparation of environmental documentation to comply with the National Environmental Policy Act (NEPA). As we found in Part 5.1 above, the Bureau wishes to provide further analysis of each of the terms and conditions proposed in the Notice, and to attempt to develop mitigation measures for any adverse impacts. Because of the Bureau's responsibility to comply with NEPA, the Bureau's environmental analysis is an important progress point in the Bureau's compliance with this order. Consequently, we will require in the time schedule for compliance with this order that the Bureau circulate its draft NEPA document and adopt its final NEPA document on the schedule which the Bureau has advised us it will meet. As we discuss in Parts 5.1, 6.0, and elsewhere, we will consider revising the terms and conditions we adopt in this order after the Bureau and the interested parties have provided further evidence and analysis, and we may adopt further terms and conditions at that time. Since we will use the Bureau's analysis for any CEQA documentation we may need after our further review, the Bureau's environmental analysis should be in the form of a combined or joint document under NEPA and CEQA. The necessary contents of the environmental analysis are specified in Part 6.0.

5.9.4 Spring Creek Power Plant

In the Notice, we asked, as a Key Issue, whether a term or condition setting forth a specific time schedule for evaluation, possible construction, and implementation of temperature control modifications to the Spring Creek Power Plant should be added to the Bureau's permits. At some times the water diverted from the Trinity River through the Spring Creek Power Plant is warmed considerably before it is released into the Sacramento River above Keswick Dam. This warming either reduces the benefit to the Sacramento fishery of adding Trinity River water (which generally is colder than Sacramento River water), or may under some conditions exacerbate already warm conditions in the Sacramento River. (T,II,75:5-14; Trinity County C, D) In accordance with its stipulation dated October 16, 1989, the Bureau submitted on March 15, 1990, a report of its evaluation of the effectiveness of alternative means of lowering the temperature of releases from the Spring Creek Power Plant. (T,I,34:11-24)

No evidence was received during the hearing regarding which structural modifications are necessary to control temperature releases from the Spring Creek Power Plant. Nor did the Bureau designate a preferred alternative in its March 15, 1990 submittal. However, it is clear

that regulation of water temperature from the Spring Creek Power Plant warrants further investigation. Consequently, we will set a time schedule for the Bureau to submit a specific plan for minimizing warming of water released through the power plant, together with a construction schedule to implement the plan and an analysis of alternative funding sources for the construction.

5.10 Reporting Requirements

In the Notice, Board staff proposed two terms, 10 and 11, to require reporting of any violations of this order, and to require reasonable monitoring and reporting of water quality to ensure compliance with this order. As part of the interim terms and conditions it proposed for calendar year 1990, the Bureau proposed undertaking a water quality monitoring program as described in Monitoring and Reporting Program No. 88-043 of the Central Valley Regional Water Quality Control Board. (Monitoring and Reporting Program No. 88-043 was withdrawn when the Regional Board waived waste discharge requirements on December 8, 1989.) The Bureau's witness testified that the Bureau has developed and is in the process of installing an automated system to monitor water temperature, turbidity and dissolved oxygen at nine

sites on the Sacramento and Trinity Rivers. A majority of these sampling stations are now operational for temperature monitoring, but it may take an additional four to six months before the turbidity and dissolved oxygen sampling is operational. Six of these stations are those described by the Regional Board order. (T,I,59:11-60:9,133:13-135:12; USBR 21,28) At stations 1 through 8 in USBR Exhibit 28, the Bureau will measure hourly for temperature, turbidity, and dissolved oxygen. At station 9 on the Trinity River immediately below Lewiston Dam, the Bureau will measure water temperature.

The Board believes that a water quality monitoring system is necessary to assure compliance with the terms and conditions adopted in this order, and to obtain data necessary for the development of final permit terms and conditions. No one objected to the Bureau's monitoring proposal. Therefore, we will adopt a term consistent with the Bureau's recommendation, in the form of a permit term or condition.

The water monitoring program we adopt includes those stations in the Sacramento River watershed and parameters, i.e., temperature, turbidity, dissolved oxygen and flow, which were described in Regional Board

Order 88-043. Additional sampling stations include a location in the Trinity River immediately downstream from Lewiston Dam being developed by the USBR, and two locations further downstream in the Trinity River in order to assure compliance with Trinity River temperature objectives.

The reporting program is also similar to the Regional Board order, but includes an additional requirement for the Permittee to submit semi-annual progress reports on the Shasta Reservoir temperature control device.

5.11 Reservation of Jurisdiction and Continuing Authority

In the Notice, the Board's staff proposed a term retaining continuing authority to amend the Bureau's permits after notice and opportunity for hearing. The Bureau instead recommended an interim term 1, which we discussed in Part 5.9.1. As we concluded in Part 5.9.1, Bureau term 1 is not suitable as a permit term; rather it is a finding which resembles our intention to give the parties additional time to analyze the issues decided preliminarily herein. Having reviewed the two proposed terms, we will adopt a term with more specificity. It may be revised after a further hearing, if necessary. In addition, we will update the general continuing authority condition in the Bureau's

permits and licenses, in accordance with the current language of our Standard Permit Term 12, which is also set forth in our regulation at 23 Cal. Code of Regs. Section 780(a). The authority recited in the continuing authority term is held by the Board as a matter of law. United States v. State Water Resources Control Board, supra. We consider it good practice to update the language in the permits when the opportunity arises, so that the permittees and licensees are informed of the most current interpretation of this authority.

6.0 CEQA COMPLIANCE

In crafting the terms and conditions herein, we have attempted to avoid or prevent any significant adverse effects on the environment as a result of this order. This order constitutes an action to enforce the requirements of Cal. Const. Art. X, Section 2, Water Code Section 275, the public trust doctrine, and the applicable water quality objectives. Therefore, under 14 Cal. Code of Regs. Section 15321(a)(2), this action is categorically exempt from the provisions of CEQA. Because this action is also an action that includes procedures for protection of the environment and is being taken to assure the maintenance and restoration of a natural resource -- namely the fishery -- and

protection of the environment, it is also categorically exempt under 14 Cal. Code of Regs. Sections 15307 and 15308.

Notwithstanding our finding that adoption of the order herein is categorically exempt from the provisions of CEQA, some of the parties have suggested that it may not be exempt. These parties point to the provision at 14 Cal. Code of Regs. Section 15300.2(c), that,

> "A categorical exemption shall not be used for an activity where there is a reasonable possibility that the activity will have a significant effect on the environment due to unusual circumstances."

Thus, the issue is whether a reasonable possibility of a significant effect exists, as a result of adopting the order herein, due to unusual circumstances.

The parties have suggested two types of possible impacts. The first is that this action could, if not adequately conditioned, result in a significant adverse effect on the fishery in the Trinity River because of removal of too much water from the Trinity system to cool the Sacramento River. We will adopt a condition in this Order that will prevent a significant adverse

effect on the Trinity River fishery as a result of operations directed toward cooling the Sacramento River to comply with this Order.

The second type of impact would be an impact related to other facilities and waterbodies that are connected to the Sacramento River. The Central Valley Water Association's witness testified that this action could affect the operations of Oroville Reservoir and Folsom Reservoir, as well as other facilities of both the State Water Project and the Central Valley Project. The witness' opinion depends on his assumption that the flow regime below Shasta would change because of this Board's order. His assumption was not substantiated.

This order does not necessarily change the flow regime below Shasta. Also, an impact on the diversion facilities cited is not, in itself, an impact on the environment. The purpose of CEQA documentation is to analyze impacts on the environment. See 14 Cal. Code of Regs. Section 15002. An EIR is required when substantial evidence exists that the project may have a significant adverse effect on the environment. Id.

The Central Valley Water Association's witness speculated that any effects on the other diversion

facilities could include fishery impacts. However, the Bureau submitted no evidence to support this speculation.

Further, it is likely that if a significant adverse effect occurs because of controlling temperature in the upper Sacramento River, the effect would occur regardless of whether we adopted this order. The Bureau has obliged itself to the fishery agencies to do essentially the same things that are required herein, and has done them during the past three years. Also, the Bureau will be obliged under the federal Endangered Species Act to protect the winter run Chinook salmon in the upper Sacramento River. Based on these facts, it is unlikely that the action herein could be considered the cause of any significant adverse effects.

Testimony received during the hearing from fishery experts shows that an inflexible interpretation of the terms and conditions set forth in our Notice could result in an adverse effect on other fisheries downstream or on the upper Sacramento River fishery itself. Such an adverse effect would result from devoting so much flow from Shasta to fishery protection in the upper Sacramento River during an early part of

the season that the Bureau would run out of water to protect the fishery later in the year. Such an inflexible interpretation would be inconsistent with the water quality objective enforced by this order. The Basin Plan temperature objective applies to controllable factors, defined as human activities that influence water quality, "and that may be reasonably controlled". If the Bureau were to make excessive releases of cool water to achieve cooler temperatures in the short term at the expense of cold water reserves necessary to protect the fishery later in the year, the Bureau would not be exercising reasonable control. Likewise, controllable factors do not include actions which would conflict with protection of threatened or endangered species.

What is needed is a flexible requirement that allows the Bureau and the fishery agencies to assess the water supply and the fishery as frequently as needed and make adjustments to meet all of the needs, as they have done during the past three years. The terms and conditions set forth in this order, as revised, provide both the flexibility and control which are needed to ensure that no reasonable possibility exists that adoption of this Order will have a significant adverse effect on the environment.

It was also pointed out during the hearing that the thermal protection measures for the fishery, until a temperature control device has been constructed, would result in a reduction in hydropower generation. Based on its interpretation of the terms and conditions proposed in the Notice, the Bureau estimated that the temperature control bypass could result in foregoing power generation worth up to $35 million in a year like 1989. Even without the modifications we are making to the staff proposal, this is not a realistic consequence. The $35 million estimate is based on the Bureau's assumptions that releases from October through January were not allowed to decrease and that the Bureau would attempt to meet the 56°F requirement at Hamilton City at all times. These assumptions were incorrect. This order clarifies our intention. The Bureau's $35 million estimate raises a question whether a reduction in hydropower generation will result in some other, more polluting form of energy generation, and whether there is a reasonable possibility that the other energy generation will have a significant adverse effect on the environment. At this point we have no evidence to show that it will.

Considering the changes we have made in the terms and conditions based on the hearing record, we conclude that there is no reasonable possibility of a significant adverse effect on the environment due to unusual circumstances as a result of this Order. Consequently, this action is exempt from CEQA. Further, we believe that CEQA is not intended to serve as a barrier to enforcement of existing standards established for protection of the environment. This is especially true in a case such as this order, which we will consider revising when the further information required herein has been submitted.

To further ensure that any potential adverse effects will be identified and analyzed, we will require the Bureau to analyze the terms and conditions adopted in this order, the terms and conditions proposed in the notice, and any other feasible alternative terms and conditions selected for analysis by either the Bureau or the Chief of the Division of Water Rights. The analysis shall identify any significant adverse effects on the environment. If the analysis identifies any significant adverse effects, the Bureau should propose alternatives and mitigation measures. Interested parties may make requests to the Chief of the Division

of Water Rights for analyses of feasible alternative terms and conditions within the scope of this proceeding.

The requirement for preparing environmental documentation is included in this Order as part of the time schedule for constructing a Shasta Reservoir temperature control device, to ensure timely consideration of any construction-related impacts. If the environmental documentation identifies any significant construction-related impacts -- or if it indicates that any of the interim conditions set by this Order could have a significant adverse environmental impact not anticipated at the time this Order was issued -- we will expedite our hearing to consider possible modifications to this Order and any findings necessary to comply with CEQA. The environmental documentation will also provide information necessary to consider additional terms and conditions not adopted as part of this Order.

7.0 CONCLUSIONS

Based on the foregoing findings and legal analysis, we conclude as follows:

1. We will consider additional evidence, not only on terms and conditions proposed in the Notice of Public Hearing that we defer adopting in this Order, but also on terms and conditions that we adopt herein, at a hearing to be convened after the analyses required herein are completed, pursuant to our reservation of jurisdiction. In the meantime, we may hold a further hearing on our own motion or at the request of the Bureau or any interested party. After the environmental effects of constructing the temperature control device have been analyzed and a CEQA/NEPA document adopted, we will hold a further hearing to consider any necessary modifications in the Bureau's permits.

2. We will adopt terms and requirements imposing a temperature requirement on the Bureau's permits and licenses to protect the salmon fishery on the upper Sacramento River.

3. Adequate evidence exists in the record to impose terms and conditions requiring ramping and a minimum flow to protect the fishery. We would prefer to have more evidence regarding the relationship between operations and salmon spawning before adopting a stricter term to prevent dewatering of salmonid redds.

4. We would prefer to have more information before adopting terms and conditions to control turbidity and dissolved oxygen.

5. Pending formal consultation under Section 7 of the federal Endangered Species Act between the National Marine Fisheries Service and the Bureau, or further information showing that the requirements in the 1988 cooperative agreement are appropriate, we will wait until we convene a further proceeding on these permits before considering adopting a term or condition to require the Bureau to comply with the 1988 cooperative agreement or similar requirements.

6. We will add a term or condition to Permits 11966, 11967, 11968, 11969, 11970, 11971, 11973, 12364, and 12365, and to License 9957 to ensure that the Bureau, in its efforts to meet the temperature requirements imposed herein for the upper Sacramento River, does not cause thermal impacts in the Trinity River adverse to the Trinity River salmon fishery.

7. We will adopt a compliance schedule for the construction of a temperature control device in

Shasta Reservoir and for related fishery protections and reporting.

8. We will require monitoring and reporting similar to that which the Regional Board required in its Monitoring and Reporting Program No. 88-043.

9. We will reserve jurisdiction and retain continuing authority to make further changes in the Bureau's permits and licenses after further opportunity for hearing.

ORDER

IT IS HEREBY ORDERED that the Permits 11966, 11967, 11968, 11969, 11970, 11971, 11973, 12364, 12365, 12720, 12721, 12722, 12723, and 12724, and Licenses 9957 and 9956, on Applications 5627, 5628, 15374, 15375, 15376, 16767, 17374, 17376, 17375, 5625, 5626, 9363, 9364, 9365, 15424, and 10588, of the U. S. Bureau of Reclamation be amended as follows:

1. Add a condition to read:

> Permittee shall operate Keswick Dam, Shasta Dam, and the Spring Creek Power Plant to meet a daily average water temperature of 56°F in the Sacramento River at Red Bluff Diversion Dam during periods when higher temperatures will be detrimental to the fishery.
>
> During periods when (a) daily average temperatures higher than 56°F will be detrimental to the fishery, and (b) factors beyond the

reasonable control of Permittee prevent Permittee from maintaining 56°F at the Red Bluff Diversion Dam, Permittee shall, after consultation with the California Department of Fish and Game, the U. S. Fish and Wildlife Service, the National Marine Fisheries Service, and the U. S. Western Area Power Administration, designate a location upstream of the Red Bluff Diversion Dam where Permittee will meet a daily average water temperature of 56°F. Factors considered to be beyond the reasonable control of the Permittee at a given location include, but are not limited to, (1) conditions where protection of the fishery can best be achieved by allowing a higher temperature in order to conserve cool water for later release, and (2) conditions where allowing a higher temperature is necessary to implement measures to conserve winter run Chinook salmon. Permittee shall immediately report any change in the location where it will meet the temperature requirement to the Chief of the Division of Water Rights, and shall file an operation plan showing Permittee's strategy to meet the temperature requirement at the new location. Permittee may then meet the temperature requirement at the new location until it is within Permittee's reasonable control to meet it at the Red Bluff Diversion Dam, unless within 10 days after submission of the report the Chief of the Division of Water Rights objects to the change.

2. Add a condition to read:

Permittee shall comply with the following time schedule for the control of upper Sacramento River fishery protection:

TASK	DATE OF COMPLIANCE
I. Shasta Reservoir Temperature Control Device	
a. Circulate draft NEPA document	May 31,1990
b. Adopt final NEPA document	December 31,1990
c. Complete construction	December 31,1993
II. Spring Creek Power Plant	
a. Submit a specific plan, including designs, for minimizing the warming of water to be discharged through the Spring Creek Power Plant	September 30,1990

b. Submit a detailed construction schedule for facilities to minimize the warming of discharge water, together with a schedule for NEPA documentation ..... September 30,1990

III. Construction Funding

a. Submit analysis of alternative funding sources for construction of the Shasta Reservoir temperature control device ..... September 30,1990

b. Submit analysis of alternative funding sources for construction of facilities to minimize warming of water discharge from Spring Creek Power Plant ..... September 30,1990

IV. Permit Terms

a. Submit analysis of permit terms and conditions with supporting data as described below ..... September 30,1990

Supporting data shall include a complete analysis of (1) the terms and conditions proposed in the Board's Notice of Public Hearing dated January 8, 1990, (2) the terms and conditions adopted by this Order, (3) alternative terms and conditions the Permittee recommends for analysis, and (4) any alternative terms and conditions which the Chief of the Division of Water Rights requests Permittee to analyze. Such analysis shall evaluate the individual and cumulative effects of each of the terms and conditions on each of the various beneficial uses of the water, including any adverse environmental effects, and shall recommend ways to mitigate or avoid any adverse environmental impacts. The analysis of any environmental effects shall be in the form of a draft combined Environmental Impact Report and Environmental Impact Statement, addressing Permittee's actions to carry out fishery protection for the upper Sacramento River including Permittee's actions to comply with requirements set by the State Water Resources Control Board.

3. Add a Condition to read:

Permittee shall conduct a monitoring and reporting program as set forth in this term. In addition, Permittee shall conduct such monitoring and reporting as is required by the Chief of the

Division of Water Rights to ensure compliance with the terms and conditions adopted in this Order. Permittee may, upon notice to all interested parties, petition the Board to review any requirement imposed under this delegation.

Permittee shall collect water samples from stations or points listed below according to the following:

STATION/POINT	DESCRIPTION
1	Shasta Dam inlets or lake adjacent to the dam face with sufficient collection points to characterize the vertical profile for temperature and turbidity.
2	Shasta Dam release immediately downstream from the power plant. (USBR monitoring station 4.)
2a	Shasta Dam release.
3	Sacramento River immediately downstream from Keswick Dam. (USBR monitoring station 5.)
3a	Keswick Dam release.
4	Spring Creek Power Plant release.
5	Sacramento River downstream from Red Bluff Diversion Dam. (USBR monitoring station 8.)
6	Sacramento River above Shasta Dam. (USBR monitoring station 1.)
7	McCloud River. (USBR monitoring station 2.)
8	Pit River. (USBR monitoring station 3.)
9	Trinity River immediately downstream from Lewiston Dam. (USBR monitoring station 9.)
9a	Lewiston Dam release.
10	Trinity River at the Douglas City Bridge.
11	Trinity River at the confluence of the North Fork Trinity River.

The following shall constitute the water monitoring:

PARAMETER	UNIT	STATION	SAMPLING FREQUENCY
Temperature	F	1	Every two weeks from May 1 through November 30.
		2	Average Daily
		3	Average Daily
		4	Average Daily
		5*	Average Daily
		6	Monthly
		7	Monthly
		8	Monthly
		9	Average Daily
		10	Average Daily from September 15 through October 1.
		11	Average Daily from October 1 through December 31.
Turbidity	Turbidity Units	1	Monthly, except weekly from May 1 through September 30 when turbidity at station 2 is equal to or greater than 10 NTU.
		2	
		3a	
		4	
		5	
		6	
		7	
		8	

* In the event that the temperature control point is moved upstream from station 5, the Permittee shall continue temperature monitoring at the new control plant.

Dissolved Oxygen	mg/l	2	Every two weeks from May 1 through September 30; samples to be taken before 1000 hours.
		3	
		5	
Flow	cfs (average daily)	2a	
		3a	
		4	
		9a	

Reporting

In reporting monitoring data, the Permittee shall arrange the data in tabular form so that the date, the parameters, and the concentrations are readily discernible. The data shall be summarized in such a manner to illustrate clearly the compliance with permit terms.

Monitoring reports shall be submitted to the State Board by the 15th day of the following month.

The results of any monitoring done more frequently than required at the locations specified in the Monitoring and Reporting Program shall be reported to the Board, if requested.

The Permittee shall initiate the above water monitoring program on the effective date of this Order.

In addition to the water monitoring reports, the Permittee shall submit a semi-annual progress report to the Board by December 31 and June 30 of each year. The progress report shall describe the progress towards Shasta Reservoir Temperature Control Device funding, construction, and NEPA compliance. Progress reports shall be submitted until full operation of the device is obtained.

4. a. Add a condition to Permits 11966, 11967, 11968, 11969, 11970, 11971, 11973, 12364, 12365, 12720, 12721, 12722, 12723, and 12724 to read:

> The State Board reserves jurisdiction and retains continuing authority over this permit to amend any term or condition after notice and opportunity for hearing, for the purpose of maintaining water quality and protecting the fishery in the Sacramento River below Shasta Dam, Keswick Dam and the Spring Creek Power Plant.

4. b. Add a condition to Licenses 9957 and 9956 to read:

> The State Board retains continuing authority over this license to amend any term or condition after notice and opportunity for hearing, for the purpose of maintaining water quality and protecting the fishery in the Sacramento River below Shasta Dam, Keswick Dam and the Spring Creek Power Plant.

5. Revise the existing standard permit term 12 to conform with the current language in Standard Permit Term 12.

IT IS FURTHER ORDERED that Permits 12720, 12721, 12722, 12723, and 12724, and License 9956, on Applications 5625, 5626, 9363, 9364, 9365, and 10588, of the U. S. Bureau of Reclamation be amended as follows:

1. Add a condition to read:

> Permittee shall decrease the release rate (ramping) from Keswick Dam at the following rates to minimize stranding of salmon:

a. Releases shall not be decreased more than 15 percent in a twelve-hour period.

b. Releases shall not be decreased more than 2.5 percent in a one-hour period.

c. This term shall not be in effect during flood control events or other unforeseen emergency conditions.

2. Add a condition to read:

> Nothwithstanding other terms herein, Permittee shall bypass or release into the natural channel of the Sacramento River at Keswick Dam and at Red Bluff Diversion Dam a minimum flow of 3250 cubic feet per second from September through February for the maintenance of fish and wildlife resources, except during critical dry years as defined in the 1960 water rights agreement between the Bureau of Reclamation and Department of Fish and Game or during emergencies which require the lowering of flows. Any lowering of flows shall be reported to the Chief of the Division of Water Rights within 5 days, together with reasons for lowering the flows. If the Chief of the Division of Water Rights objects, Permittee shall immediately restore the flows to 3250 cubic feet per second.

IT IS FURTHER ORDERED that Permits 11966, 11967, 11968, 11969, 11970, 11971, 11973, 12364, and 12365 and License 9957, on Applications 5627, 5628, 15374, 15375, 15376, 16767, 17374, 17376, 17375, and 15424, be amended to add a condition as follows:

> Permittee shall not operate its Trinity River Division for water temperature control on the Sacramento River in such a manner as to adversely affect salmonid spawning and egg incubation in the Trinity River. Adverse effects shall be deemed to occur when average daily water temperature exceeds 56°F at the Douglas City Bridge between September 15 and October 1, or at

the confluence of the North Fork Trinity River between October 1 and December 31 due to factors which are (a) controllable by permittee and (b) are a result of modification of Trinity River operations for temperature control on the Sacramento River.

If the temperatures in the Trinity River exceed 56°F at the specified locations during the specified periods, Permittee shall immediately file with the Chief of the Division of Water Rights a report containing project operational data sufficient to demonstrate that the exceedance was not due to modifications of Trinity River operations for water temperature control on the Sacramento River. If, within fifteen days, the Chief of the Division of Water Rights does not advise Permittee that it is violating this condition of its water right, Permittee shall be deemed not to have caused the exceedance in order to control temperature on the Sacramento River.

This term is not to be construed as interfering with the U. S. Department of Interior Andrus Decision dated January 14, 1981 relative to Trinity River releases.

CERTIFICATION

The undersigned, Administrative Assistant to the Board, does hereby certify that the foregoing is a full, true, and correct copy of an order and regularly adopted at a meeting of the State Water Resources Control Board held on May 2, 1990.

AYE: W. Don Maughan
Edwin H. Finster
Eliseo M. Samaniego
John Caffrey

NO: None

ABSENT: Darlene E. Ruiz

ABSTAIN: None

Maureen Marché
Administrative Assistant to
the Board