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March 1, 2009

Filed via Electronic Submission (E-File)

Project No. 2179-042 –California
Merced River Hydroelectric Project
Merced Irrigation District

SUBJECT: Review and Comments on Relicensing Pre-Application Document Public Information (November 2008). Request for Additional Information Gathering, and Study Requests for the Merced River Hydroelectric Project (P-2179-042)

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E., Room 1A
Washington, DC 20426

Dear Ms. Bose:

Please find enclosed comments and submissions of the Merced River Conservation Committee regarding Merced Irrigation District's (MID) Relicensing Pre-Application Document (PAD), Information Gathering Requests and our Study Requests following FERC's Licensing Process Study Request Criteria [CFR 18, Section 5.9(b)].

Enclosed we provide:

- Comments and recommendations on MID's PAD
- Summary of Information Gathering Requests
- Attachment A. Four Study Requests

Merced River Conservation Committee appreciates the opportunity to comment on this Relicensing document . Any questions regarding our comments should be directed to me at (209) 966-6406 or by email at mmartin@sti.net.

Sincerely,

Michael Martin, Ph.D.

Comments on Merced Irrigation District's Pre-Application Document, Information Gathering Requests, and Study Requests

Merced River Conservation Committee (Conservation Committee) provides herein comments on the Merced Irrigation District's (MID) Relicensing Pre-Application Document, issued on November 3, 2008, pursuant to Section 16.6 of Title 18 of the Code of Federal Regulations (CFR) and in accordance with Federal Energy Regulatory Commission (FERC) guidelines regarding electronic submission for MID's Merced River Hydroelectric Project, FERC No. P-2179-042 (Project).

Conservation Committee provides these comments consistent with the spirit and intent of the Federal Power Act (FPA) of 1920, as Amended (16 U.S.C. §§ 791-828c). Two sections of the FPA are particularly relevant to this relicensing. Section 4(e) contains two considerations: FERC gives equal consideration to developmental and environmental values, and mandatory conditioning authority on "federal reservations". The second Section (10j) of the FPA states that FERC must include conditions to adequately protect, mitigated damage to, and enhance fish and wildlife and their habitats based on recommendation by state and federal fish and wildlife agencies. The comments and recommendations contained herein pertain to California natural resources of the Merced River that may be affected by the construction, maintenance, and operation of the Merced River Hydroelectric Project.

1.0 Introduction

The Applicant should revise the PAD and correct omissions, errors and interpretations that are not supported by the literature, data, and findings in referenced materials. As user's of the Merced River, for recreation, fishing, and wildlife observation, Conservation Committee believes that a balanced description of, as well as consideration for, the natural resources of the Merced River is in the best interest of the Public Trust of the Region and the State. All of the beneficial uses of the river should be protected, enhanced, and mitigated where unavoidable project effects have occurred, continue to occur, and most likely will occur in the future. Conservation Committee supports FERC in the relicensing of the Merced River Hydroelectric Project, where the project's construction, operation, and maintenance comply with major applicable laws. Conservation Committee considers Project effects extend beyond the immediate boundaries of the "FERC Project Boundary", supported by the fact that the current FERC License contains minimum streamflow requirements measured more than 20 miles downstream of the FERC Project Boundary (Shaffer Bridge, RM 32.5). In the absence of the project, Conservation Committee believes that a more normal "run of the river" would be more beneficial to fish and wildlife resources than the current condition. Conservation Committee has comments and recommendations on the "Description of Existing Environment", including Geology and Soils; Water Resources; Aquatic Resources; and Threatened, Endangered, and Fully Protected Species. We have several issues with regard to the Applicant's characterization of Activities, Effects, Existing Information, and Need for Additional Information in PAD Section 8 Issues, Activities,

and Effects. Applicant is not proposing five “Flow-related Articles in Existing License”, which are related to Minimum Streamflows (2 Articles), Ramping Rates, Releases from Lake McClure, and Lake McClure Elevation, and indicates that it is premature to speculate as to what flow-related PM&E measures may be needed, until a final list of issues to be addressed is developed through the FERC’s NEPA public scoping process. Conservation Committee recommends that FERC prepare an Environmental Impact Statement, rather than an Environment Assessment, commensurate with the overall scope of the project: the size of the Project, the amounts of water diverted, and the size of impacts to natural resources that have occurred, and will continue to occur with Project construction, operations, and maintenance. Even though the Articles 40 through 44 and environmental restoration streamflows have compromised the anadromous fish restoration efforts of the Merced River, lesser minimum streamflows, ramping rates, releases from Lake McClure, and Lake McClure Elevation would unquestionably and unequivocally cause more and continuing adverse impacts to lower Merced River fisheries and riparian habitat. Without comment, the Applicant rejected issues related to anadromous fish in the lower Merced that were raised in the July August 2008 issue identification process of the Agency/Public Meetings. Conservation Committee recommends that FERC include those issues in its analysis of possible mitigation, protection, and enhancement measures for the Project, as well as the rationale or reasoning for rejection of consideration of the issues. We have several comments and recommendations on Study Plans, proposed by the Applicant: Hydrologic Alteration; Water Balance/Operations Model; Water Quality; Water Temperature Model; and Special-Status Fishes. Five Issues were suggested as potential effects of the project on ESA-Listed anadromous fishes (e.g. Steelhead trout); only the effect of temperature on ESA-Listed anadromous fishes (Issue T&E-1) has been partially addressed by Applicant’s Study Plan. Conservation Committee believes that additional Study is needed to address other aspects of Steelhead restoration, conservation, and enhancement: T&E-2 (Attraction Flows), T&E-3 (adult holding and spawning; juvenile holding), T&E-4 (stranding) and T&E-5 (up and downstream passage); Conservation Committee is submitting 4 Study Requests to address those issues (Appendix A).

2.0 SPECIFIC COMMENTS ON PRE-APPLICATION DOCUMENT

Section 3.1.1 General Overview of the River Basin (Page 3-4, paragraph 3): The applicant briefly described a diversion into the Main Canal, CDFG’s fish hatchery, and the private fish hatchery. The flows (and amounts) of water diverted, and not returned to the Merced River, should be identified, so that the description of the diversion can be interpreted more directly. It is more than likely that most of the approximately 2100 cfs of water that is withdrawn is not returned to the Merced River, which is implied from the statement on page 3-9: “with the exception of diversions into the Northside and Main canals, all ...returns are beyond the control of the Licensee.”

Section 3.1.2 Basins Affected by the Merced River Hydroelectric Project (Page 3-5, paragraph 1). The PAD indicates there are three types of potential effects from continued Project operation and maintenance (O&M): direct effects, indirect effects, and cumulative effects. The PAD states that it does not include potential effects from new project

construction, and the amended PAD or a separate report to FERC should specify how new project construction effects will be addressed and incorporated into the relicensing. New Projects included a pumped storage development adjacent to Lake McClure (Page 6-33) and increased usable storage at Lake McClure by two alternatives (Page 6-33). These activities have potential effects on natural resources within and beyond the FERC Project boundary, and how these impacts will be evaluated and addressed in the Relicensing Process, along with a schedule to determine how it blends with the current FERC adopted process, should be identified by the applicant.

The PAD (Page 3-5, paragraph 1) indicates that direct, indirect and cumulative Project effects are addressed in greater detail in Sections 7 and 8 of the PAD. There are only 4 references to potential Project effects in Sections 7 and 8: Page 7.2-2 Describes where effects may occur; Page 8-3 A reiteration of the definition of effects; Page 8-10 Indirect and cumulative effects can occur downstream of Lake McClure; Page 8-16 Dewatering can cause indirect and cumulative effects to macroinvertebrates. This is an extremely brief and inadequate analysis/description of the potential direct, indirect, and cumulative Project effects that may occur because of Project construction, operations and maintenance. Conservation Committee recommends a comprehensive evaluation of the project activities, with a Relicensing Participant consultation and collaboration on: 1) a more quantitative analytical process of "Project Effects" (Section 8.1.3 Potential Effects); 2) evaluation of the individual "major resources described generally on Page 7-1; and 3) determine if information and data are adequate to be used in the Environmental Impact Statement analysis, and in the development of protection, mitigation, and enhancement measures of major resources affected by the project.

A very clear example of direct project effects is on the anadromous fish populations of the lower Merced River. Recent numbers of returning fall-run Chinook in the Merced, Tuolumne and Stanislaus Rivers have been precariously low, to the point where the Fish and Wildlife Service, in April, 2008, stated that these fall-runs are in danger of extirpation, an assessment that seems to be supported by a model developed by the California Department of Fish and Game and presented to the State Water Resources Control Board in September, 2008 (Loudermilk, 2008). Returns of fall-run Chinook salmon to the Merced River in 2008, as shown in preliminary data collected by DFG, numbered about 438 adults (see Page 7.3-21 for comment) observed. The year previously (2007) there were 573 adults. This run peaked in 2000 (13,076 adults), so there has been a major catastrophic reduction in adult salmon escapement in the Merced River. These are year-class population numbers that place the Merced fall-run Chinook salmon in immediate danger of extinction in the Merced River. This is also recognized by NMFS as a serious threat of extinction of fall-run Chinook salmon and Steelhead trout. Another alarming conclusion of the biologists is that "endangered steelhead survival out of the San Joaquin is near zero," with water flows being major problems. Much of the mortality by the San Joaquin out migrants is caused by the negative flows in Old and Middle rivers. Fish are unable to move to the North Delta because of these southward moving "reverse" flows (Bacher, 2009). Merced River Hydroelectric Project operation virtually controls more than 95% of the flows in the Merced River. There is not enough flow in the San Joaquin River to push water in the correct direction for migrating smolts. Ocean

conditions and Delta water exports have been suggested as factors in salmon and steelhead declines, but it is the in-basin instream flows that have put salmon and steelhead populations on the brink of extinction in the Merced River, according to the natural resources agency scientists.

Section 3.1.2.1 Portion of Basin Subject to Direct/Indirect Project Effects

Section 3.1.2.2 Portion of Basin Subject to Cumulative Project Effects

Conservation Committee strongly disagrees with applicant's characterization of direct, indirect, and cumulative project effects. The nexus of this disagreement is that applicant used the wrong standard (FERC Project Boundary from Federal Power Act or FPA) as a tool to select or evaluate project effects on environmental receptors. Conservation Committee strongly believes that other Federal and state laws (Endangered Species Act, National Historic Preservation Act, Wild and Scenic Rivers Act, National Environmental Policy Act, Magnuson-Stevens Fishery Conservation and Management Act, California Endangered Species Act, and California Fish and Game Code), that must be complied with as well as the FPA) are the appropriate and applicable standards for the evaluation of project impacts, including determine the zone of influences or areas of potential impacts of the Project. For example, if NEPA has a the requirement of a broader area for evaluation of environmental impacts than the California Fish and Game Code, then the environmental analyses must use the NEPA standard, which would be broader analysis or larger than an area considered under CFGC, but it would include the area that CFGC considers.

While this section of the PAD suggests that Project O&M could have an incremental effect on the Merced River below Crocker-Huffman Diversion Dam, other sections of the PAD espouse a philosophy that the Project is beyond the scope or nexus of the FERC process, that is assessment of impacts solely are only within the boundary of the FERC project (see Section 5, page 5-1, paragraph 1). For example, in the discussion of Issue AR-8 (Page 8-17), the applicant states that the project includes two dams, McSwain and New Exchequer Dams. Neither dam has fish passage devices or programs. Two other dams, below the Project boundary block fish passage (because of inoperable fish ladders). Therefore the applicant concludes that the project has no effect on fish passage, because the fish are blocked before they reach Project facilities. The blockage of anadromous fish passage is a direct effect that limits the spawning and rearing habitats for anadromous fish (Chinook salmon, lamprey, and Steelhead trout). When constructed in 1924-1926, one project dam, Exchequer Dam, eliminated anadromous fish passage in the Merced River. Blockage of fish passage for anadromous fish has remained continuously and uninterruptedly for 83 years to this day. In the interim, two larger dams have been constructed which prevents anadromous fish passage. One anadromous fish restoration alternative is to re-establish connectivity between lower and upper Merced River basins, to expand habitat suitable for anadromous fish reproduction and juvenile holding habitat. If that is to be accomplished, fish have to get past the FERC project MID dams (including New Exchequer and McSwain), as well as the non-FERC Project dams. The current alternative of trying to enhance "tailwater" habitat in the lower Merced River for the anadromous fish population restoration, by providing temperature enhancements, has

been unsuccessful, as stressors are inhibiting expansion of populations of threatened or species of concern in the “tailwater” habitat of the lower Merced River. Arguably there could be a multitude of factors affecting the survival of these fishes, but there is a very strong connection between anadromous fish population successes and wet water years. The resolution of the future of water management of water and anadromous fisheries in the California Bay-Delta and San Joaquin River Basin is likely to be greatly clarified over the next ten years, and to some unknown extent during the time that the relicensing process for the Merced Project takes place.

There are a number of different jurisdictions and agencies overseeing the management of aquatic habitat and anadromous fishes of the Merced River. This large number of jurisdictions presents significant difficulties for both FERC and for Relicensing participants, as well as for other jurisdictional agencies and parties concerned with aspects of management outside the Merced Project’s FERC boundary; nevertheless, Conservation Committee believes FERC process should consider that the effects of the project on anadromous fish species below the Merced River Hydroelectric Project are direct effects, which affect the survivability and enhancement of the existing populations.

The Federal Power Act, Section 10(a)(1), 16 U.S.C. § 803(a)(1) requires:

“That the project adopted, including the maps, plans, and specifications, shall be such as in the judgment of the Commission will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for the use or benefit of interstate or foreign commerce, for the improvement and utilization of water-power development, for the adequate protection, mitigation, and enhancement of fish and wildlife (including related spawning grounds and habitat), and for other beneficial public uses, including irrigation, flood control, water supply, and recreational and other purposes... .”

If the term “comprehensive” cited above is to have meaning, then a comprehensive plan for the Merced River and waters upstream and downstream of the Merced Project cannot be decided independently without integration into an overall waterway perspective from the San Francisco Bay-Sacramento San Joaquin River Delta to the headwaters of the Merced River, as opposed to divided up the waterway solely according to FERC project boundaries of the Merced River Hydroelectric Project, as it appears to be proposed by the applicant in Section 3.

Page 3-6, paragraph 3. The report refers to Section 5.3 for additional actions and Federal and State comprehensive plans that “may affect potentially cumulatively-affected areas”, but Section 5.3 refers to a List of Attachments.

Section 3.2 Climate. An important planning factor or element that the PAD has failed to include is the effects of potential global warming on precipitation, water availability, and temperatures both within and beyond FERC Project boundaries in the Merced River

Drainage. A study by the Public Policy Institute of California (2008), titled “Preparing California for Climate Change,” points out that the average temperatures in the state will increase by 2 to 4 degrees by mid-century, much of which will occur in the summer months. The Central Valley will feel much more of the heat than other areas. The warming will mean less rain, the study speculates. The warmth will reduce the snowpack in the mountains that has been counted on to supplement water needs when the rains tail off in the spring. The study says that snowpack may be reduced by anywhere from 12 to 42 percent. Coupled with the lack of snowpack may be increased rainfall during the winter months for which the reservoir capacities in the Merced River basin are very much smaller than those in northern California, which currently receives large percentages of their water supply via rainfall. This reduction in snowpack and the lack of storage capacity may dramatically alter seasonal availability of water for maintenance of beneficial uses in the watershed. In the amended PAD or a separate report to FERC, the applicant should include an analysis and discussion of the effects of climate change with reference to predicted weather conditions and water supply in the Merced River (CH2MHill, 2001). Helping aquatic species maintain viable habitat conditions in the face of temperature increases, sea level rise, and salinity incursions will likely require changes to reservoir operations, water diversions, water right permits, and discharge permits – as well as acquisitions of areas to expand or maintain wetland habitat (because of new ideas about flood control operations). The development of a predictive model for changing water supply of the Merced River watershed, based upon future snow and rainfall pattern variations, should be a high priority for management of water supply and demands. This evaluation should be carried through to the descriptions of all resources affected (Section 7), and be considered for Proposed Studies (Section 10).

Table 3.5-1, page 3-10. Under SWRCB Water Rights License 2685, Mariposa County Public Utilities District diverts up to 7 cfs when the Merced River Flow exceeds 50 cfs, with an annual permitted diversion of 5,000 acre-feet per year. The Table (at Footnote ^a) indicates downstream of McSwain Reservoir received return flows from numerous unnamed irrigation canals and ditches. Are their data available on the volumes, rates, and quality of these return waters to the Merced River?

The Table should be amended to include the mainstem Merced River below the section entitled “Into Lake McClure”, mainstem Merced River into McSwain Reservoir, mainstem Merced River downstream of McSwain Dam to RM 0 at the intersection with the San Joaquin River.

Section 4.1.2 Endangered Species Act of 1973, as Amended (16 USC § 1531 et seq.)

On page 4-2 (second paragraph), the report indicates that “Section 7.7 discusses species listed and designated critical habitat and ESUs that Licensee will address in the Relicensing proceeding.” Within Section 7.7, there is no discussion of critical habitat for Steelhead, California Central Valley DPS (*Oncorhynchus mykiss irideus*), except for its mention on page 7.7-2. The description of the life histories and biology on pages 7.7-16 and 7.7-17 might be an appropriate place to discuss designated critical habitat, and what its importance is to FERC Relicensing on the Merced River. Included in that discussion should be what the applicant considers “action area” from Project, with respect to the

Endangered Species Act and National Environmental Policy Act, particularly with reference to those factors or population controllers potentially affecting the Steelhead trout (e.g., water quality, water quantity, habitat availability, spawning habitat, etc.).

Section 4.1.7 National Environmental Policy Act of 1969 (42 USC § 4321) - The PAD discusses the National Environmental Policy Act of 1969 (NEPA), which is the national policy objective of environmental protection. Applicant states that an Environmental Assessment (EA) or Environmental Impact Statement (EIS) are typical NEPA documents for an application for a new license. Actually the process may be a little more complicated than the applicant describes. For relicensing applications, FERC's regulations for implementing NEPA establish that the initial NEPA document prepared will be an Environmental Assessment (EA). NEPA defines an EA as "a concise public document" that serves to "briefly provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact." If the EA suggests that the proposed project will have significant environmental impacts, FERC will prepare an Environmental Impact Statement (EIS). Compared to an EA, an EIS is a more comprehensive study in which FERC must "rigorously explore and objectively evaluate all reasonable alternatives" for the project. As part of this analysis, FERC must solicit and respond to resource agency and public comments on the proposed project. Preparation of an EA only requires FERC to involve resource agencies and the public "to the extent practicable." If FERC's initial EA suggests no significant impacts, FERC will issue a finding of no significant impact (FONSI). In such cases, preparation of an EIS is not necessary.

There is a strong emphasis placed in NEPA documents on identifying and reducing potential effects of actions on the environment. The CEQ regulations (40 CFR 150.8) define several types of effects that should be evaluated in a NEPA document. Effects include "(a) Direct effects, which are caused by the action and occur at the same time and place. (b) Indirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in pattern land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems." As stated in these regulations, effects and impacts are used synonymously. Cumulative impacts are defined by the regulations as: "the impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other action. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

Section 4.2. - The PAD correctly identifies the California Endangered Species Act (California Fish and Game Code or CFGC) as a state law that applies during the relicensing proceeding. However, there are a number of other State Regulations and

Laws and policies that apply to the Merced River Hydroelectric Project with respect to anadromous and resident fisheries:

Fish and Game Code Section 700 et seq.

Section 711.1(a). The fish and wildlife of the state are held in trust for the people of the state by and through the Department of Fish and Game.

Fish and Game Code Section 1600 et seq.

This statute gives the California Department of Fish and Game the authority to regulate activities that would alter flow, bed, channel or bank of natural streams and lakes in which there is at any time an existing fish and wildlife resource or from which these resources derive benefit.

Fish and Game Code Section 1740 et seq.

Section 1741. It is the policy of the state to preserve and enhance black bass resources and to manage black bass populations to provide satisfactory recreational opportunities.

Section 1743 (a) (4). The department shall improve shoreline habitat for black bass in waters where insufficient habitat exists and shall encourage reservoir operating agencies to carry out shoreline habitat improvement projects.

Fish and Game Code Section 1800 et seq.

Section 1802. The department has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species. The department, as trustee for fish and wildlife resources, shall consult with lead and responsible agencies and shall provide, as available, the requisite biological expertise to review and comment upon environmental documents and impacts arising from project activities, as those terms are used in the California Environmental Protection Act (Division 13 (commencing with Section 21000) of the Public Resources Code).

Fish and Game Code Section 5650 et seq.

Section 5650 (a) it is unlawful to deposit in, permit to pass into, or place where it can pass into the waters of this state specific substances.

Fish and Game Code Section 5900 et seq.

Section 5931. If, in the opinion of the commission, there is not free passage for fish over or around any dam, the department shall cause plans to be furnished for a suitable fishway, and order in writing the owner of the dam to provide the dam,

within a specified time, with a durable and efficient fishway, of such form and capacity and in such location as shall be determined by the department. Such fishway shall be completed by the owner of the dam to the satisfaction of the department within the time specified.

Section 5933. Whenever an application for approval of plans and specifications for a new dam in any stream in this State, or for the enlargement of any dam in any such stream, is filed with the Department of Water Resources, pursuant to Part 1 (commencing with Section 6000) of Division 3 of the Water Code, a copy of such application shall be filed by the applicant with the commission. If then the commission deems that the construction of a fishway over such a dam is necessary for the preservation and protection of fish, and that construction and operation of such fishway is practicable, it shall set a date for a hearing to be held within 90 days after filing of such application with the commission. At such hearing the applicant shall be entitled to introduce evidence to show that construction of the fishway is not necessary or is not practicable, taking into consideration the height of the dam and the amount of water available. If, after the hearing, the commission finds that the construction of the fishway is necessary and practicable it shall, within five days after such hearing, notify the applicant to that effect. After notice from the commission that a fishway is required, it shall be unlawful to commence the construction of any new dam or the enlargement of any dam without first obtaining the written approval of the commission of the design for such a fishway.

Section 5937. The owner of any dam shall allow sufficient water at all times to pass through a fishway, or in the absence of a fishway, allow sufficient water to pass over, around or through the dam, to keep in good condition any fish that may be planted or exist below the dam. During the minimum flow of water in any river or stream, permission may be granted by the department to the owner of any dam to allow sufficient water to pass through a culvert, waste gate, or over or around the dam, to keep in good condition any fish that may be planted or exist below the dam, when, in the judgment of the department, it is impracticable or detrimental to the owner to pass the water through the fishway.

Section 5938. Whenever in the opinion of the commission it is impracticable, because of the height of any dam, or other conditions, to construct a fishway over or around the dam, the commission may, in lieu of the fishway, order the owner of the dam completely to equip, within a specified time, on a site to be selected by the department, a hatchery, together with dwellings for help, traps for the taking of fish, and all other equipment necessary to operate a hatchery station, according to plans and specifications furnished by the department. After such hatchery has been constructed, the department shall operate it without further expense to the owner of the dam except as provided in Sections 5940 and 5941.

Section 5942. The commission may, in lieu of a fishway, hatchery, dwelling, traps or other equipment necessary to operate a hatchery station, order the owner

of the dam to plant, under the supervision of the department, the young of such fish as naturally frequent the waters of the stream or river, at such times, in such places, and in such numbers as the commission may order.

Fish and Game Code Section 6900 et seq. (passed in 1988)

Section 6900. This chapter shall be known and may be cited as the Salmon, Steelhead Trout, and Anadromous Fisheries Program Act.

Section 6900 (d). Protection of, and an increase in, the naturally spawning salmon and steelhead trout resources of the state would provide a valuable public resource to the residents, a large statewide economic benefit, and would, in addition, provide employment opportunities not otherwise available to the citizens of this state, particularly in rural areas of present underemployment.

Section 6900 (e). Proper salmon and steelhead trout resource management requires maintaining adequate levels of natural, as compared to hatchery, spawning and rearing.

Section 6900 (f). The protection of, and increase in, the naturally spawning salmon and steelhead trout of the state must be accomplished primarily through the improvement of stream habitat.

Section 6902. The Legislature, for purposes of this chapter, declares as follows:

(a) It is the policy of the state to significantly increase the natural production of salmon and steelhead trout by the end of this century (= 1999). The department shall develop a plan and a program that strives to double the current natural production of salmon and steelhead trout resources.

(b) It is the policy of the state to recognize and encourage the participation of the public in privately and publicly funded mitigation, restoration, and enhancement programs in order to protect and increase naturally spawning salmon and steelhead trout resources.

(c) It is the policy of the state that existing natural salmon and steelhead trout habitat shall not be diminished further without offsetting the impacts of the lost habitat.

California Fish and Game Commission Policies.

Salmon Policy. It is the policy of the Fish and Game Commission that:

I. Salmon shall be managed to protect, restore, and maintain the populations and genetic integrity of all identifiable stocks. Naturally spawned salmon shall provide the foundation for the Department's management program.

II. Salmon populations shall be periodically inventoried by the Department, or its agents, as necessary for management and protection of salmon stocks and their habitat, as outlined in this policy.

III. Salmon streams shall be inventoried for quantity and quality of habitat, including stream flow conditions. Restoration and acquisition plans shall be developed and implemented to safeguard such critical habitats as estuaries, coastal lagoons, and spawning and rearing areas, and to protect or guarantee future instream flows. Fisheries Restoration grants and other funding may be directed to implement the plans.

IV. Existing salmon habitat shall not be diminished further without offsetting the impacts of the lost habitat. All available steps shall be taken to prevent loss of habitat, and the Department shall oppose any development or project that will result in irreplaceable loss of fish. Artificial production shall not be considered appropriate mitigation for loss of wild fish or their habitat.

V. The Department shall strive to improve habitat conditions, alleviate threats, and renegotiate mitigation requirements at appropriate opportunities to eliminate the need for fish rescue operations. Salmon rescue will not be considered as mitigation for proposed water development. Only under the following circumstances shall salmon be rescued:

A. When they will be returned to the stream system of origin; and

B. When fish can be held until habitat conditions in the place where they were collected improve, or when fish can be immediately released in nearby areas of the same stream and the Department has determined that no adverse impacts would occur to existing salmonid populations; and

C. When, in the opinion of the Department, habitat conditions are temporarily inadequate or when conducted pursuant to a permitted in-stream construction or restoration activity.

VI. Hatchery releases of Chinook salmon in anadromous waters will be externally marked and coded-wire tagged at the current Department standard.

VII. New programs that propose to propagate state-or federally-listed salmon shall conform to the Department's guidelines for establishment and operation of recovery hatcheries found in the Recovery Strategy for California Coho Salmon, Appendix H. In coastal streams without Department hatcheries, artificial rearing shall be limited to areas where the Department determines it would be beneficial to supplement natural production to re-establish or enhance the depleted wild population. In the Sacramento, American, Feather, San Joaquin, Klamath and Trinity River systems, hatchery production shall be used to meet established mitigation goals. At the discretion of the Department, excess eggs from non-listed

salmon from the State, Federal, or cooperative hatcheries may be used to provide additional fish for the commercial and sport fisheries. Because of potential adverse impacts, all salmon reared from excess eggs that are intended to be released into estuaries, bays, or the ocean for fisheries enhancement must be marked so that potential impacts and efficacy of the project can be evaluated. Specifically, the projects must provide to the Department, within five years of the adoption of this policy, a written evaluation of their operations that specifically addresses: 1) potential impacts to nearby stream environments; 2) potential impacts to ESA or CESA listed salmonid populations; and 3) efficacy of the project in meeting project goals and objectives. The Department will assess the evaluations and will provide a recommendation to the Commission on whether this section of the policy should be continued.

VIII. Domesticated or non-native fish species will not be planted, or fisheries based on them will not be developed or maintained, in drainages of salmon waters, where, in the opinion of the Department, they may adversely affect native salmon populations by competing with, preying upon, or hybridizing with them. Exceptions to this policy may be made for stocking drainages that are not part of a salmon restoration or recovery program.

IX. The best available scientific information will be used by the Department to assess the salmon resource and to develop management strategies and recommendations

(Amended: 06/18/93; 06/18/05; 05/09/08)

Anadromous Rainbow Trout Policy

It is the policy of the Fish and Game Commission that:

I. Anadromous rainbow trout, commonly called steelhead, shall be managed to protect and maintain the populations and genetic integrity of all identifiable stocks. Naturally spawned anadromous rainbow trout shall provide the foundation of the Department's management program.

II. Anadromous rainbow trout populations shall be periodically inventoried by the Department, or its agents, as necessary for management and protection of the anadromous rainbow trout stocks and their habitat, as outlined in this policy.

III. Anadromous rainbow trout streams shall be inventoried for quantity and quality of habitat, including stream flow conditions. Restoration and acquisition plans shall be developed and implemented to safeguard such critical habitats as estuaries, coastal lagoons, and spawning and rearing areas, and to protect or

guarantee future instream flows. Steelhead Fishing Report - Restoration Card Program and other funding may be directed to implement the plans.

IV. Existing anadromous rainbow trout habitat shall not be diminished further without offsetting mitigation of equal or greater long-term habitat benefits. All available steps shall be taken to prevent loss of habitat, and the Department shall oppose any development or project that will result in irreplaceable losses. Artificial production shall not be considered appropriate mitigation for loss of wild fish or their habitat.

V. The Department shall strive to improve habitat conditions, alleviate threats, and renegotiate mitigation requirements at appropriate opportunities to eliminate the need for fish rescue operations. Anadromous rainbow trout rescue will not be considered as mitigation for proposed water development. Only under the following circumstances shall anadromous rainbow trout be rescued:

A. When they will be returned to the stream system of origin; and

B. When fish can be held until habitat conditions in the place where they were collected improve, or when fish can be immediately released in nearby areas of the same stream and the Department has determined that no adverse impacts would occur to existing salmonid populations; and

C. When, in the opinion of the Department, habitat conditions are temporarily inadequate or when conducted pursuant to a permitted in-stream construction or restoration activity.

VI. Sport fishing for anadromous rainbow trout shall be encouraged where the Department has determined that angling will not harm existing wild populations. Angling of juveniles shall only be permitted where such angling does not impair adequate returns of adults for sport fishing and spawning. Special angling regulations for naturally spawned anadromous rainbow trout may be necessary when a fishery includes both naturally spawned and hatchery stocks. These regulations shall be consistent with restoration and recovery goals.

VII. Domesticated or non-native fish species will not be planted, or fisheries based on them will not be developed or maintained, in drainages of anadromous rainbow trout waters, where, in the opinion of the Department, they may adversely affect native anadromous rainbow trout populations by competing with, preying upon, or hybridizing with them. Exceptions to this policy may be made for stocking drainages that are not part of an anadromous rainbow trout restoration or recovery program.

VIII. The Department will continue marking all hatchery anadromous rainbow trout and selective harvest of marked fish will be allowed only where the

Department has determined that the harvest will not impair the viability of the population.

IX. The Department will continue to investigate stocking of sterile rainbow trout in waters within anadromous rainbow trout drainages, where the Department has determined that stocking reproductively viable rainbow trout may have an adverse effect on the genetic integrity of the anadromous rainbow trout populations. Stocking of sterile rainbow trout in anadromous rainbow trout drainages will not be conducted if the Department determines there may be an adverse affect to existing wild anadromous rainbow trout populations.

X. In streams without Department hatcheries, artificial rearing shall be limited to areas where the Department determines it would be beneficial to supplement natural production to re-establish or enhance the depleted wild population. New programs that propose to propagate state- or federally- listed anadromous rainbow trout shall conform to the Department's guidelines for establishment and operation of recovery hatcheries found in the Recovery Strategy for California Coho Salmon, Appendix H.

XI. The best available scientific information will be used by the Department to assess the anadromous rainbow trout resource and to develop management strategies and recommendations.

(Amended: 06/18/93; 05/09/08)

Land Use Planning

It is the policy of the Fish and Game Commission that:

The preservation, protection and restoration of fish and wildlife resources within the State is of significant public interest and is inseparable from the need to acquire, preserve, protect and restore fish and wildlife habitat to the highest possible level, and to maintain in a state of high productivity those areas that can be most successfully used to sustain fish and wildlife and which will provide appropriate consumptive and nonconsumptive public use. To carry out these purposes, it is essential that a comprehensive program be implemented by the Department to assure that there will be close coordination with state, federal and local planning agencies, including county boards of supervisors and other decision-making entities in the formulation and implementation of any plans including, but not limited to, county general plans and any modifications to such plans, which may impact fish or wildlife.

I. Commensurate with this policy, the Commission recognizes that:

A. The land resources of the state provide an essential habitat component necessary for the annual renewability and well-being of the state's fish and wildlife resources;

B. The land resources are a limited resource subject to increasing demands;

C. Conservation, efficient planning and implementation of various land uses are necessary to meet the competing needs of urban communities, industry, agriculture, recreation, and fish and wildlife; and

D. There is a need for the Department to provide timely consultation with Federal, State and local governments and agencies on land use planning and projects with a view toward resolving conflicts with the Department management plans, programs and other responsibilities.

E. Locally developed regional landscape conservation planning is a forward-looking method which can provide early resolution of land use/wildlife resource protection conflicts and lead to the preservation of essential wildlife habitat while allowing for appropriate growth and economic development.

II. To provide maximum protection and enhancement of fish and wildlife, the Department shall:

A. Promote the development of regional conservation planning at the ecosystem level through active participation in the local development of regional Natural Community Conservation Planning (NCCP) and other forward-looking multiple habitat conservation planning efforts.

B. Review, coordinate and provide comments and recommendations on federal, state, local general plans, special plans and proposed projects as appropriate, including the conservation and land use elements adopted by local government pursuant to provisions of Section 65300 et seq., of the Government Code for the purpose of determining the consistency of such plans with Commission policies, and the goals and objectives of the Department's management plans, programs and other responsibilities for the state's fish and wildlife resources. An initial review of local general plans will be completed by January 1986;

C. Carry out subsequent reviews of general and special plans and proposed projects and provide appropriate comments and recommendations to the affected federal, state and local government or agency, as needed to assure such plans remain consistent with the Commission's policies and the Department's management plans, programs and other responsibilities;

D. Notify the Commission prior to adoption, if possible, but as soon as feasible, when a federal, state or local general or special plan, or a proposed project authorized by such a plan, is determined to be in conflict with Commission policy

or the Department's management plans and programs, and would have a significant adverse impact on fish or wildlife resources. In the case of local agency plans or special projects where changes are made late in the review and comment period or at an adoption hearing, notification of the Commission will be within 30 days following the receipt by the Department of the text of the approved plan or project;

E. Provide to the Commission as soon as feasible, the Department's remedial action or actions for responding to such findings and determinations or the Department's reasons for finding that no remedial action is necessary. In the case of local agency plans or special projects, notification of the Commission will be within 30 days following the receipt by the Department of the text of the approved plan or project;

F. Participate in the local land use planning process and project review implemented in connection with the requirements of Section 21,000, et seq., of the Public Resources Code, for the purpose of conserving and protecting fish or wildlife habitat consistent with the Department's management plans, programs and other responsibilities;

G. Oppose the adoption of plans or portions of plans for land use or approval of proposed projects if, after following diligent efforts to resolve issues affecting fish and wildlife resources, the Department finds that such actions are not consistent with the Department's management plans, programs and other responsibilities and will result in significant losses to fish and wildlife resources.

(Amended 3/3/94)

Water

It is the policy of the Fish and Game Commission that:

I. The quantity and quality of the waters of this state should be apportioned and maintained respectively so as to produce and sustain maximum numbers of fish and wildlife. Commensurate with this policy, the Commission recognizes that:

A. The waters of the state are a limited resource subject to ever increasing demands; and that

B. Conservation and the efficient management of water resources are necessary to meet the competing needs of urban communities, industry, agriculture, recreation and fish and wildlife.

II. Quantity:

To provide maximum protection and enhancement of fish and wildlife and their habitat, the Department shall:

A. Review and comment on proposed water development projects, on application for licenses or permits for water use, water development, and on projects affecting aquatic habitat.

B. Recommend and seek the adoption of proposals necessary or appropriate for the protection and enhancement of fish and wildlife and their habitat. The primary habitat objective is the maintenance of natural conditions in state waters, the adaption of impounded waters for fish and wildlife purposes, and the creation of new waters or areas which will support fish and wildlife, provided that such new waters enhance fish and wildlife.

C. Oppose the issuance of permits or licenses, or the authorization of appropriation of funds for water use projects which have not prevented or adequately compensated for damage to fish and wildlife resources.

D. Prepare and render reports on water use or development in relation to their effect on fish and wildlife at the request of federal or state agencies whenever the same may be required by law or otherwise be appropriate.

E. Monitor and maintain surveillance over existing water use projects to prevent avoidable damage to aquatic habitat and to insure compliance with fish and wildlife protection or enhancement requirements.

F. Take an active part in the planning of water development projects, and take appropriate action designed to insure adequate water supplies to maintain and enhance fish and wildlife habitat.

G. Assist, cooperate, and negotiate agreements with federal, state, public or private agencies or organizations, subject to the approval of the Commission, provided Commission approval shall not be required for agreements of a routine nature except when they call for a substantial augmentation of the budget.

H. Seek an allocation of water for fish and wildlife on an equitable basis with other uses, and protect fish and wildlife from the hazards created by such other uses.

I. Periodically reassess permit and license terms and conditions and where feasible, seek corrective action where original terms and conditions were inadequate.

J. Advise the Commission at one of its regularly scheduled meetings of any project which may have significant adverse impacts on fish and wildlife, and shall indicate the measures by which fish and wildlife resources will be protected from

damage by the project in question. The Department shall also state the extent to which the agency or person preparing the plans for such project has incorporated therein plans for enhancing such resources.

K. Maintain field and technical expertise in all areas of instream flow assessment in order that the Department can provide recommendations which are biologically sound and technically defensible.

III. Quality:

Encourage and support programs to maintain or restore a high quality of the waters of this state, and prevent the degradation thereof caused by pollution and contamination. The Department shall take all appropriate actions to further these ends. In addition, the Department shall inform the State Water Resources Control Board and Regional Water Quality Control Board of water quality problems affecting fish and wildlife and shall seek mutual cooperation in solving such problems.

IV. Access:

Endeavor to keep as much water as possible open and accessible to the public for the use and enjoyment of fish and wildlife.

(Amended 11/3/94)

Section 5 Consistency with Comprehensive Plans

The PAD asserts that most, if not all, of the comprehensive plans are simply related only to water deliveries downstream of Crocker-Huffman Diversion Dam, and not within the FERC designated boundary of the Project. FERC should reject this faulty logic, assertion and argument that because potential and existing adverse effects to downstream resources occur outside the FERC Project Boundary, the applicant can chose to ignore them, without further evaluation or consideration. The fact is that diversion and storage of water for hydropower generation occurs in Lake McClure, and the New Exchequer Dam controls the entire quality and quantity of water in the lower Merced River Basin. In the absence of the Project facilities, the patterns of river flows and water quality/quantity conditions would be markedly and dramatically different that the existing conditions. Mitigation, protection, and enhancement of anadromous fish resources in the Merced River would be vastly simplified and technically easy without the Merced River Hydroelectric Project in place. If the project were not present, minor improvements on, or removal of, two small dam fish ladders would reconnect the upper and lower Merced Rivers, and reopen more than 99% of the original anadromous fish spawning and rearing habitats. Clearly and simply, the Federal Power Act, Section 10(a)(1), 16 U.S.C. § 803(a)(1) requires that the Project be best adapted to a comprehensive plan for

developing the Merced River with adequate protection, mitigation, and enhancement of fish and wildlife resources (including related spawning grounds and habitat, and other beneficial uses of the water). The current FERC license recognizes the Project's responsibility for consistency with plans and policies below the Crocker Huffman Diversion Dam, including compliance with conservation and development of fish and wildlife resources (Articles 10 and 11), compliance with minimum streamflows (Articles 40 and 41, Article 42, Article 43), along with the PAD's identification of consistency with water rights, water quality and quantity standards, ESA and CESA (e.g., Section 4.1.2, Section 4.2.1, and Page 7.7-2), and other laws of California and the United States (Section 4).

Section 5.1.2.1 South Fork Merced River Wild Trout Management Plan (CDFG 1979)

The applicant argues that only impacts from physical project facilities located on the South Fork of the Merced River can affect fisheries resources. The primary purpose of the wild trout program is to preserve attractive trout stream fisheries, which are naturally sustained by wild strains of trout as opposed to fisheries that are artificially maintained with stocking of catchable-sized trout on a put-and-take basis. Guidelines for specific management of the South Fork are: a) to maintain wild trout populations at levels necessary to provide satisfactory recreational angling opportunities; b) to maintain and enhance where possible the habitat required for optimum wild trout production; and c) to preserve the natural character of the streamside environment. It would appear that guidelines for the management of the South Fork, Merced River, Wild Trout Fishery, are not currently being met. The current condition of the fish populations is not known, with the last Department of Fish and Game surveys occurring in the early 1980's (Bartholomew, pers. comm.); he reported excellent populations of large rainbows and even larger introduced brown trout. Beck (1996) reported the South Fork populations to be extremely depressed and not worth the trouble of hiking down the Savage-Lundy trail to fish near Peach Tree Bar. The causes of this apparent change in populations are unknown, but this section of river is virtually free of angling pressure because of the extremely difficult nature of access by the Savage-Lundy trail. Although there have been no studies of the genetics of the South Fork rainbows, it is possible that they are descendents of the original Merced River Steelhead rainbow stock, and have become land-locked by the construction of dams and diversions in the lower river, such as the Exchequer Dam. In the early 1960's, DFG poisoned a section of river below Peach Tree Bar, and planted rainbow trout (CDFG, 1979). The construction of the New Exchequer Dam continued to prevent basin interconnection between the upper and lower river habitats, and this condition prevails today. The bisection of the Merced River by hydroelectric project dams has been a continuous and uninterrupted direct effect and influence on the upstream populations of the (now) resident rainbow trout, as they are prevented from up- or down-stream migration past New Exchequer Dam. With a conservation hatchery effort and re-establishment and re-population of the South Fork, Merced River, above the New Exchequer Dam, this direct Project effect could be mitigated and result in enhancement of wild rainbow trout with natal Merced River Steelhead stock.

6.2 Project Facilities

Pages 6-3 and 6-4. The New Exchequer (NE) Dam has a crest elevation of 879 feet, and it is 490 feet high (PAD, 2008). By subtraction, the bottom of the NE Dam should be at the 389 foot elevation. This would make it approximately 11 feet lower than the McSwain Reservoir elevation. It would be helpful to reviewers if the bathymetry were described, especially the elevation of the lake bottom at the edge of the NE Dam. The section on morphometric data (Table 7.2.6-1) would estimate the elevation of the lake bottom at approximately 467 feet, and that conflicts with an estimate derived from a description of the NE Dam.

Section 6.3.1.4 Compliance with FERC License

This section is titled “Compliance with the FERC License” and would be presumed to analyze how the applicant has met FERC License terms. For example, Articles 40 and 41 address minimum streamflow in various water year conditions with flows delivered to Schafer Bridge, located at RM 32.5. There is no data reported to confirm that applicant complied with that FERC License condition. Conservation Committee recommends that the PAD be amended, FERC be provided, with a summary report of compliance with Articles 40 and 41.

The PAD discussed several of the water related compliance issues, suggesting that others were not “germane to Project operations”. Conservation Committee believes that compliance with all FERC License conditions is the standard by which FERC regulates the Merced River Hydroelectric Project. Therefore, all FERC License Articles are germane to Project Operations, Maintenance, and Construction.

Article 39. This is an agreement with Army Corps of Engineers regarding flood control operations of Lake McClure. The PAD refers the reader to Section 6.3.1.1. Section 6.3.1.1 is a discussion of Assurance of Public and Employee Safety. The amended PAD or a separate report to FERC should provide more details of how flood control operations are related to Assurance of Public and Employee Safety.

Article 13 and Page 6-20. “So far as is consistent with proper operation of the project, the Licensee shall allow the public free access, to a reasonable extent, to project waters and adjacent project lands owned by the Licensee for the purpose of full public utilization of such lands and waters for navigation and for outdoor recreational purposes, including fishing and hunting, and shall allow to a reasonable extent for such purposes the construction of access roads, wharves, landings, and other facilities on its lands the occupancy of which may in appropriate circumstances be subject to payment of rent to the Licensee in a reasonable amount: Provided, that the Licensee may reserve from public access such portions of the project waters, adjacent lands, and project facilities as may be necessary for the protection of life, health, and property, and Provided further that the Licensee’s consent to the construction of access roads, wharves, landings, and other

facilities shall not, without its express agreement, place upon the Licensee any obligation to construct or maintain such facilities. These facilities are in addition to the facilities that the licensee may construct and maintain as required by the license” (underlining added).

Fish, wildlife, and outdoor recreational uses on public lands are increasingly important conditions on FERC permitted licenses, as areas in California become more heavily impacted by urban growth and development. Any use of MID project area lands are required to have a validated paid “day use” permit. This includes undeveloped properties, wild trails, and lake banks (sides) for hiking, fishing, and wildlife observations. Hunting is prohibited on Lake McClure and McSwain, but not on adjacent BLM property (beyond ½ mile of the center of the Merced River). The amended PAD or a separate report to FERC should discuss how MID has complied with terms and conditions stated in Article 13 over the life of the current license. The applicant should state how it allows “free public access”, whilst requiring a permit fee for access to public land. The applicant should state how “project waters and adjacent public lands owned by the Licensee” serve “full public utilization of such lands and waters for navigation and recreation purposes including fishing and hunting.” If those lands and activities are considered to be “occupancy of which may in appropriate circumstances be subject to the payment of rent to the Licensee”, the applicant should provide an audited evaluation of how those rent schedules were developed, justified, and implemented. Public funds were used for capital expenses to develop all of the recreational facilities, so presumably all fees for use of boat ramps, docks, access roads, trails, and wildlife viewing are now for assuring public safety and maintenance of facilities. Those audited expenses and justifications should be included in the amended PAD or a separate report to FERC to document compliance with Article 13. Conservation Committee recommends to FERC that the new permit more explicitly define the terms of the old permit (free public access, full public utilization for fishing and hunting, development of appropriate rent schedules for facilities use). For example, none of the trails (Bagby to Briceburg) have been maintained, improved or provided law enforcement by the applicant. Why should recreation users of those trails pay a fee for its use?

6.6 Current Net Investment

This seems to be a very simple statement (without documentation) of the net Project book value of the Merced River Hydroelectric Project Value. An audited statement of that value would provide a professional evaluation and transparency to conclude that this is an acceptable value of the Current Net Investment. Conservation Committee suggests that it would seem as a rather undermarket value for the investments expended. The amended PAD or a separate report to FERC should fully analyze the Current Net Investment for the Project.

6.7 Proposed New Generation Facilities/and or Changes in Project Operation to Increase Generation

Without any substantive characterization, project applicants propose two gigantic changes to current project operations: pumped storage and encroaching on USACE flood

storage regulations. In PAD- and issue-gathering meetings in summer 2008, the applicant stated that they were investigating raising the New Exchequer Dam height to be able to store more water in Lake McClure (July 2008). Without environmental assessment characterization, compliance assessment, and economic assessment, the applicants simply propose to include these significant changes in their Project Operations. FERC should more information and justifications for these ideas, as they lack full disclosure, details of plan, compliance with Corps of Engineers concurrence, and compliance with all State and Federal environmental laws and regulations. Conservation Committee feels that this may more appropriately addressed as issues after the 2014 license has been granted by FERC. At that time, Conservation Committee can provide further comments, evaluation, and recommendations on the propose change, since the applicants have provided no details on their suggested changes in operations; we would be glad to provide further analyses and recommendations as an Alternative Project Analysis on this issue should the applicants provide full disclosure of their plans.

Section 7 Description of Existing Environment

Section 7.1 Geology and Soils

Section 7.1.4 discusses past gold mining activities along with other mineral resource extraction issues. Lacking from the discussion by the applicant is the use (and release) of mercury during gold mining activities. State Water Resources Control Board has identified the Merced River from Lake McClure to the mouth at San Joaquin River as a 303(d) CWA- listed area for impairment of beneficial use. SWRCB has released a draft list of additional areas for the 2009 update, which includes Lake McClure. Conservation Committee believes the mobilization process (or lack thereof) for mercury transfer into water, sediments, and the aquatic food web has geologic and geomorphic implications that should be included in the applicant's amended PAD or provided by separate report to FERC. Conservation Committee has additional comments in the Study Plan 2.3 Water Quality.

Section 7.1.6.2. The PAD (Page 7.1-8) indicates that the applicant has “not dredged or otherwise removed sediment from either Lake McClure of (sic) McSwain Reservoir since the dams were constructed.” Conservation Committee notes that applicant has not mechanically removed sediment, but operations of the McClure and McSwain Reservoir can mobilize sediment particles that can be transported downstream, and resettled causing potential damage to the benthic environment. Inspection of Figure 7.2.3-18 shows periods of dramatic changes in historical surface elevations (? draining the lake). During the site FERC visit (January 2009), little water was exiting Lake McClure and the surface elevation of Lake McSwain appeared to be abnormally low. High turbidity (? caused by sediment particles) was observed in both Lake McSwain, below Merced Falls Dam, and downstream at Crocker-Huffman Diversion Dam. Conservation Committee is aware that from time to time, below McSwain Dam, PG&E performs soil/sediment removal which interferes with Merced Falls Dam operations, releasing turbidity and sediment downstream. Does this sediment/turbidity come from some other source than the upstream Project? Conservation Committee recommends that the applicant assess,

monitor and report the rates and mass of sediment and particulate transport under operational conditions during rapid drawdowns, lake drainage, or high flood releases.

Section 7.1.6.3 discusses the general geologic and geomorphic history and current conditions of the Merced River downstream of the Project. There is no mention or reference to the past and current direct effects of the Project on gravel and sedimentation patterns in the aquatic habitat as a result of the Project in aquatic habitats downstream of Project facilities. The hydrology of the Merced River has been altered by the hydroelectric power development and flood control operations of the Project, which together have reduced peak flow magnitudes, altered seasonal flow patterns, reduced temporal variability, and reduced spring snowmelt and summer baseflows. These changes in hydrologic conditions have reduced the frequency of bed scour, reduced the river's capacity to transport sediment, and reduced the frequency, duration, and magnitude of floodplain inundation (Stillwater Sciences 2001). Since 1926, sediment supply from the upper 81 percent of the watershed has been intercepted at the original Exchequer Dam and then the New Exchequer Dam. This interception has eliminated virtually all of the river's historical sediment supply, thus depriving the river of basic components for maintaining a geomorphic equilibrium. Under pre-dam conditions, the bed was likely mobilized by small, relatively frequent floods that occurred about every 1–2 years. With the reduction in flood magnitude caused by flow regulation, the bed is currently immobile at flows up to the 5-year recurrence interval flow (Q5) (Stillwater Sciences 2001). As a result, the channel bed and formerly active bars are static, and riparian vegetation has encroached into the formerly active channel. These major geologic modifications have significantly affected natural instream gravel and sedimentation cycles, and, in turn, have adversely affected the spawning and rearing habitats for anadromous (and resident) fishes and benthic macroinvertebrates. This change in the natural instream gravel and sedimentation cycle caused by Project construction, operations, and maintenance has a continuing effect on the Merced River from the upper end of the FERC Project Boundary downstream Lake McClure to RM 0 at the mouth of the Merced River. The primary restoration issues in the lower Merced River include Project induced flow reduction, alteration of seasonal flow patterns, lack of bed-mobilizing flows, lack of coarse sediment supply, along with several non-Project related alterations (conversion of the floodplain to tailings piles and channel confinement). The lack of coarse sediment supply and lack of bed-mobilizing flows have resulted in channel simplification and confinement and prevent the accumulation and retention of valuable salmon and steelhead spawning gravel. The conversion of floodplain to tailings and the confinement of the channel by the tailings piles prevent floodplain inundation during high flows and have eliminated the processes by which riparian vegetation is established and renewed, resulting in encroachment of vegetation into the channel and reduced riparian habitat (Stillwater Sciences, 2004). Conservation Committee recommends that a more complete discussion of the gravel/sedimentation alterations by Project construction, operations, and maintenance and its effects upon alteration of instream anadromous fish and benthic macroinvertebrate habitat be included in the amended PAD or a separate report to FERC.

Section 7.2 Water Resources

Section 7.2.5.2 Non-Power Water Rights Affecting or Potentially Affected by the Project

Table 7.2.5-2 lists non-power water rights held by Merced Irrigation District. SWRCB Permit 1224 allows diversion of 1500 cfs at Crocker Huffman Diversion from March 1 until October 31. SWRCB Permit 10572 allows diversion of 257 cfs from March 30 until August 1 at Crocker Huffman Diversion. The report only discusses MID's post-1914 water rights. Stillwater Sciences (2001) stated that the district's rights include pre-1914 and post-1914 appropriative water rights. The pre-1914 rights are summarized below: The Exchequer Mining Right permits Merced ID to divert up to 6,000 cubic feet per second (cfs) from the river when it is available as inflow. The Crocker Huffman Land and Cattle Company right is for direct diversion of 2,125 cfs and 300,000 acre-feet of storage each year from the Merced River. This latter pre-1914 appropriative water rights may be equal to or greater than the post-1914 rights. The amended PAD or report to FERC should include all rights that MID claims, to allow the environmental impact analysis to be a transparent document for the public, supported by a comprehensive information and database. An issue that is lacking with the PAD with respect to water quantities (regulated by SWRCB) is the projected water demands for Merced Region. The Merced Water Supply Plan (CH2M Hill 2001) recognizes several trends that influence the projected demand: a) applied agriculture water demands within Merced ID are projected to decrease, while agricultural demands outside Merced ID are anticipated to remain stable; b) urban water uses are estimated to increase. The projected increases considers expansion of University of California campus; c) instream flows needed for fisheries on the Merced River and downstream could increase depending on the final outcome of findings deliberations between Merced ID and state and federal resource agency representatives; d) State Water Resources Control Board (SWRCB) issued Water Right Decision 1641 in 1999. Included in that decision has been a provision for Merced ID to release up to 55,000 acre feet (af), in addition to its existing instream fishery releases, for a period of 12 years in association with the VAMP; e) Environmental uses of water are increasing; f) current trends of water supply from the Merced River have been declining over the past three decades. Vogel (2003, Table 3) characterizes the lower Merced River currently agreed to water demands for a water year, below Crocker Huffman Diversion Dam: FERC & Davis Grunsky (wet: 72161-84139 af; dry: 67151-79129 af) + VAMP (55,000 af) + DFG-MID agreement (12,500 af); Total (dry year: 134,651 - 146,629 af & wet year: 139,661 - 151,639 af). Merced Irrigation District annual water demand (Main and North Canal diversions) is 560,000 af (Stillwater Sciences, 2001). Conservation Committee notes that the PAD has not included projected water demands, including options to solve demand issues with declining water production, from the Merced River. Conservation Committee recommends an analysis and alternatives to the future water demands, based upon these declining projections to provide background, data, analyses, and alternatives to be considered in the environment impact assessment to be conducted for the Project.

Section 7.2.8 Applicable Water Quality Standards This section refers reviewer to a section (4.1.10) along with a table (4.1.10-1) that is not in the PAD. Section 4.1.10

describes Federal Land Policy and Management Act. The corrected information should be included in the amended PAD or a report to FERC and the Relicensing Participants.

Section 7.2.9.1 Merced River Upstream of the Project (Page 7.2-30) With reference to Vogel (2003), the PAD identifies that this report as a Phase I report for the Anadromous Fish Restoration Project (AFRP). This is the first of a series of a four-phase effort to improve fall-run Chinook salmon populations by developing protective temperatures in the “tailwater” section of the Merced River below Crocker-Huffman Diversion Dam. Phase II was to develop a water temperature model for the 4 reservoirs and lower Merced River. The results of the water temperature modeling were to lead to an engineering feasibility study to determine the operational and/or structural measures, if any, that could be implemented to improve the water temperature regime for anadromous salmonids in the lower Merced River while concurrently ensuring reliability in Merced ID’s water supplies (Phase III). Assuming the outcome of Phase III developed measures that could be feasibly implemented, Phase IV would be to seek and secure funding for those measures and implement the Project. Phase II model development has been completed and calibrated for the Merced River (Avry Dotan, pers. comm.). The Amended PAD or a report to FERC should describe where the applicant is in the Phase III efforts, that is, the engineering feasibility study to determine operational and/or structural measures that might improve water temperature regimes in the lower Merced River (and Merced River Hatchery).

- Phase I: Compilation of existing temperature information and data
- Phase II: Development of reservoir and river water temperature models (Dotan AV Engineering and Don Smith)
- Phase III: Engineering feasibility study to determine temperature controls with operations and structural measures
- Phase IV: Securing funding and implementing water temperature improvements

Conservation Committee believes that structural modifications of the Project can be configured to provide improvements in temperature conservation for the Project. Further issues are discussed below in Section 8.2.2.4.

Figures 7.2.9-5 through 7.2.9-8. These figures show the temperatures (°F) in the Merced River at RM 52, RM 47, RM 42, and RM 31. During the critical summer months between May and October in many of the water years (i.e., WY99) temperatures for Steelhead trout juveniles and Chinook salmon smolts are approaching lethality at RM 42 (data lacking for WY 99 at RM 47), and downstream. One of the objectives of the Phase III feasibility study would be to evaluate alternatives to bring cold water from Lake McClure (52 °F) and not be at + 60 °F. Conservation Committee suggests that one alternative strategy is to not try and maintain over-summering juvenile habitat in restricted “tailwater” reaches of the lower Merced River, but to interconnect the lower and upper Merced River and provide the full historical over-summering juvenile habitat in the upper Merced River, above Lake McClure. The concept of such upper and lower basin interconnection and Steelhead trout restoration is presented in within Appendix A (Conservation Committee’s Study Requests) and Martin (2008).

Section 7.3 Aquatic Resources

Table 7.3.3-1. List of fishes reported to occur currently in the Merced River

Rainbow trout are listed in Status as (None). Below Crocker-Huffman Dam, Zimmerman *et al.* (2008) reported presence of Steelhead trout (FT) in the Merced River, below Crocker Huffman Diversion Dam, as did Stillwater Sciences (2008). Also, NMFS has designated the Merced River, below Crocker Huffman Diversion Dam as Steelhead trout critical habitat. The status for Rainbow Trout should be changed to FT, not None. There have been no studies to confirm or deny the status of Rainbow trout above Crocker Huffman, and the presumption that they are all resident Rainbow (hence not FT) has not scientifically been determined at this time. All rainbow trout that occur above Crocker Huffman could be indicated with a “?” to note it is undetermined as to their state of anadromy. Chinook salmon (= king salmon in the fishing reports) have been planted and are taken as sport fish in Lake McClure (CDFG, 2003 and Page 7.3-16 of the PAD). Calaveras Fish Farm has planted Brown Trout and Brook Trout in Lake McSwain (Table 7.3.3-4). Conservation Committee suggests that the amended PAD or a report to FERC update the table regarding the fishes reported to occur in the Merced River.

Fish Management and Fish Stocking (Page 7.3-12, paragraph 2 and paragraph 5)

There is no “Put and Grow Fishery” (= “Subcatchable Trout”) in the mainstem Merced River. DFG plants “catchable” trout in Mariposa County: Bull Creek (tributary to North Fork, Merced River, McClure Reservoir, McSwain Reservoir, Merced River Sec II (Rosebud Picnic Area to Briceburg), and in Merced County: Merced River Sec I (below McSwain Dam and above Merced Falls Dam; please refer to: <http://www.dfg.ca.gov/news/stocking/> . Conservation Committee suggests that the amended PAD or a report to FERC strike the inaccurate information about subcatchable trout planting in the Merced River.

Paragraph 3 - The applicant’s information about the fish planting activities on the upper Merced River in 2007 contains some typographical errors. This was a “trophy trout” planting of 22,000 rainbow trout, ranging in size from 1 to 3 lbs, and 4,000 rainbow trout, from 6 to 10 lbs. The trout were Friant Hatchery raised broodstock trout of two origins (Fraser River steelhead-smaller individuals) and Redband (? Eagle Lake) trout from McCloud Hatchery stock) (Mitchell, pers. comm.).

Paragraph 4 – The applicant’s information about fish planting in the Merced River upstream of Lake McClure is inaccurate. DFG routinely stocks the mainstem Merced River between Foresta Bridge and Briceburg with “catchable” rainbow trout, generally between early winter months until mid-summer, when water temperatures between Briceburg and Foresta Bridge become too warm to support rainbow trout. The 2007 planting was a special activity coordinated with local Mariposa/ Merced residents and the California Department of Fish and Game (<http://www.goldrushcam.com/2007/Mariposa%20News/mariposa30.htm>).

Page 7.3-17 paragraph 1 – CDFG has regulations for trout and salmon fishing in Lake McClure and Lake McSwain. Both lakes are open year around. The daily bag limit and possession limit are the same: daily bag limit 5 trout and salmon, combined; possession limit 5 trout and salmon, combined.

Page 7.3-19 - Brown (1999) and Pers. Comm., L. Brown, August 7, 2008 – Brown reported two other fish species, prickly sculpin and rainbow trout, at the site labeled: MERCED R BL SNELLING DIV DAM NR SNELLING CA. http://ca.water.usgs.gov/sanj/eco_cycle1.html @ sanj9426.bds

With reference to the McConnell State Park site, the data shows 10 species were reported.

Page 7.3-21 - CDFG's Annual Spawning Ground Surveys - Table 3.3.5 reporting the annual adult Chinook salmon escapement estimates for the Merced River and the Merced River Fish Facility have been updated: 2007 had 79 in MRFF, 479 in-river, total **576**; 2008 had 66 in MRFF, 398 in-river, total **464** (<http://sanjoaquinbasin.com/fishbio-sanjoaquin-basin-newsletter.html>) @ Jan 27, 2009 Volume 3, Issue 6 newsletter.

Fish Management - California Fish and Game Commission implemented a no take (= bag and possession limit of 0 salmon) regulation for salmon in the Merced River for 2008 [Subsection 7.50(b)(118) B, Title 14, CCR]. There is an existing bag and possession limit for 0 bag and possession limits for Steelhead rainbow trout in the lower Merced River.

Pages 7.3-24 through 7.3-26 - The overall purpose of the PAD for Fish and aquatic resources is for: 1) Identification of existing fish and aquatic communities, 2) Identification of essential fish habitat, 3) Temporal and spatial distribution of fish and aquatic communities and trends with respect to: a) Standing crop, b) Age and growth data, c) Spawning run timing, d) Extent and location of spawning, rearing, feeding, and wintering habitat. The PAD provides a description of the studies that have been done or are supposed to be done, but it is deficient in not extracting the results of those studies, and providing description of the information that is required for describing fish and aquatic resources and the impacts of the Project on those resources. For example, Table 7.3.3-6 identifies some USFWS Anadromous Fish Restoration Program Projects that have occurred, or are currently occurring on the Merced River (some of the studies are at least 9 years old), or are supposed to occur. To comply with the FERC PAD purposes, the amended PAD or a report to FERC should extract and report the significant findings of these studies that have been completed and should determine whether the studies by USFWS and CDFG addressing issues of fisheries and aquatic habitat will be completed in time for inclusion into the applicant's license environmental documents and FERC permit. If those study elements that have a nexus to the FERC licensing and environmental compliance requirements and they are not going to be completed in time to be utilized in the FERC process, the applicant should conduct those studies immediately. All of this information should be summarized in the amended PAD or report to FERC with the applicant's plan for completion of the analyses.

Table 7.3.3-6 - This table summarizes some of the biological studies that are being, or have been, performed by California Department of Fish and Game. The studies that have not been included on the list are found below in Section 3.0 Information Requests – 2. The PAD provides the names and general purpose of the studies that have been done or are supposed to be done, but it is deficient in not extracting the results of those studies, and providing data and information that could be used for describing fish and aquatic resources in the lower Merced River and the impacts of the Project on those resources in the environmental assessment process. Many of the projects are listed as “proposed in 2009”, “not yet implemented”, “partially implemented”, or “ongoing. To comply with the FERC PAD purpose of defining the effects of the Project on Fish and Aquatic Resources, the amended PAD or a report to FERC should extract and report the significant findings of these studies that have been completed and should determine whether the studies by CDFG addressing issues of fisheries and aquatic habitat in the lower Merced River will be completed in time for inclusion into the applicant’s license environmental documents and FERC permit. If those study elements that have a nexus to the FERC licensing and environmental compliance requirements and they are not going to be completed in time to be utilized in the FERC process, the applicant should conduct those studies immediately. All of this information should be summarized in the amended PAD or report to FERC with the applicant’s plan for completion of the environmental analyses.

Section 7.7 Threatened, Endangered and Fully Protected Species – Applicant states that it eliminated from further consideration three fish species, because these species do not occur in the Project Vicinity. The purpose of collection of environmental information is to provide existing, relevant, and reasonably available information regarding aquatic species that could be affected by Merced Irrigation District’s Merced River Hydroelectric Project. The applicant’s assertion that it only has to address issues that involve currently existing species that occur within the Project boundary or Project Vicinity. The Federal Power Act (FPA) under 16 U.S.C. § 797 (e) states:

In deciding whether to issue any license, the Commission, in addition to the power and development purposes for which licenses are issues, shall 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 recreation opportunities, and the preservation of other aspects of environmental quality.

It is implicit that in order to give equal consideration to protection, mitigation of damage to, and enhancement of fish and wildlife, FERC must evaluate environmental impacts of the Project. In order to evaluate the environmental impact(s) to species protected under the Endangered Species Act, FERC must clearly distinguish between the project boundaries (a FPA defined term) and the environment affected by the project or the action area (an ESA defined term). Action area refers to the area directly or indirectly affected by the proposed action. This area will usually be larger than the project footprint. An applicant should anticipate the informational needs of a NEPA document and design

studies accordingly. FERC's relicensing regulations at 18 CFR 16.8(b)(i) require that the applicant provide detailed maps of the project boundaries and at 16.8(b)(iv) the applicant must additionally provide an identification of the environment affected, or to be affected, and proposed mitigation. FERC would not make the applicant provide separate maps or descriptions if the effect of the project was the same as the project boundaries.

Further, in FERC's regulations stipulating what must be included in a license application includes information on fish and wildlife "in the vicinity of the propose project", not just within the project boundaries [18 CFR 4.41 (f)(3)]. In 18 CFR 4.41(f)(3)(i), FERC requires a description of resources in the "proposed project area and its vicinity" and requires mitigation for impacts on fish and wildlife. These are FERC regulations which emphasize a clear distinction between "project area" and the vicinity of the project for the purpose of defining impacts and mitigation on natural resources.

FERC's guidance includes the inclusion of Exhibit E in the preparation of an applicant's license. Exhibit E includes a summary of the resource agencies' views on resource needs in the project vicinity and region. This exhibit requirement to collect information on resources affected, or potentially affected, confirms FERC's distinction between the two boundaries.

Section 8.2 Issues, Activities and Effects

8.2.1 Geology and Soils

8.2.1.1 Issue G&S-1 The effect of the Project on geomorphic processes, including sediment and gravel transport in Merced River downstream of Lake McClure.

Potential Effects. Applicant asserts that there is a direct effect of the Project of loss of storage in the reservoir. A second effect of sediment and gravel is both indirect and cumulative because the sediment might not continue to move downstream. Conservation Committee believes that downstream hydrologic conditions cause sediment and gravel modifications (from Project's streamflow releases) that may affect benthic macroinvertebrates, fish spawning habitat and behavior, and riparian vegetation. There are two direct effects caused by the Merced River Hydroelectric Project, and the other two dams on the river. The first direct effect was initially caused, and then completely and uninterruptedly continued today, by the construction of the dams. That Project event terminated all gravel and sediment replenishment from the upstream basins below each of the dams. The second direct effect occurs during operation in flood stage of the Merced River Hydroelectric Project and the other two dams on the river. When flows exceed 3000 to 5000 cfs, benthic sediments and gravels may be displaced and re-deposited, but it uncertain if Project flow releases mobilize gravel and sediment (See Section 7.1.6.3). This certainly occurred during the January 1997 high water flow releases. This direct impact may affect the quality and quantities of suitable benthic macroinvertebrate, fish spawning, and riparian vegetation. The fish habitat restoration projects on the Merced River below the Crocker Huffman Diversion Dam to replenish spawning gravels are partial mitigation for the loss of historic and current sediment and gravel replenishment

caused by the Project direct effects. During project maintenance activities, periodic releases of high turbidity water is also suspected to interfere with fisheries habitat and fishing in downstream reaches of the Merced River below the Merced Hydroelectric Project.

8.2.1.2 Issue G&S-2 - Effect of the Project on geomorphic processes, including sediment and gravel storage in the Merced River upstream of Lake McClure and downstream of Crocker-Huffman Impoundment.

Potential Effects. Applicant asserts that there are no effects on geomorphic processes upstream of Lake McClure. Applicant is non-responsive to geomorphic issues downstream of Crocker-Huffman Diversion Dam. Nevertheless, the applicant has proposed to do a fish passage study in Lake McClure and the upper Merced River. The tributary passage assessment will be conducted at a relatively low period of reservoir capacity. During the survey, field teams will access tributaries by boat. The potential for fish passage will be identified by estimating the gradient at the confluence of the lake and available connective flow (PAD, Study 3.1 Special-Status Fishes, Page 7 of 12). The morphology and hydrology of the Merced River at the interface with Lake McClure has been modified by the hydraulic conditions caused by the river-lake interactions. This interaction generally causes deposition of sediments, gravel, boulders, and other materials, which may have a direct impact on fish, benthic communities, and fish passage for resident Rainbow trout (and other stream spawning fish species), as well as for future fish passage of restored anadromous fish (Steelhead rainbow trout). It may also cause the water in the river to go subsurface or "sieve" through unconsolidated sediments. Please see Issue G&S-1 for Conservation Committee comments on direct effects of the Project downstream of the Merced River Hydroelectric Project.

8.2.2.1 Issue WR-1 – Effects of Project on instream flow and water quantity.

Potential Effects. Applicant asserts that the Project does not have a direct effect on instream flows. In conjunction with PG&E's Merced Falls Project, they also assert that "the Project indirectly and cumulatively effects (sic) instream flow and water quantity in the 2-3 mile long section between the Merced Falls Dam and Crocker Huffman Diversion Dam". With respect to applicant's assertion that the Merced Falls Project affects water quantity, the PAD (@ page 8-8, bullet 3) directly contradicts this assertion because the Merced Falls Dam has virtually no storage capacity, and otherwise diverts no water from the Merced River, and is unable to re-regulate flows. MID diverts water (North Canal) from the PG&E Project. Conservation Committee cannot understand how the Merced Falls Dam affects instream flows. Conservation Committee agrees with Stillwater Sciences (2008) opinion that the Project operations regulate instream flows: "flow in the lower Merced River is regulated by New Exchequer Dam (RM 62.5) and McSwain Dam (RM 56)." The amended PAD or a letter to FERC should explain the logic and support for the assertion.

In further evaluation of the issue of instream flows and water quantity in the Merced River, the New Exchequer Dam (and McSwain Dam) (Merced River Hydroelectric

Project) have the only capacity to regulate instream flows on the Merced River by diversion and storage. For all intents and purposes, the applicant controls essentially all diversion capacity in the Merced River from the Crocker Huffman Diversion Dam to the junction of San Joaquin River, though its appropriated water rights (almost an order of magnitude over the combined lower Merced River Diversions, i.e. 2200 vs. 250 cfs). The applicant believes that only when Project releases are greater than 2000 cfs does “the Project indirectly and cumulatively effect (sic) instream flow and quantity in the Merced River downstream of Crocker-Huffman Diversion Dam.”

The issue of instream flows and water quantity effects have a direct bearing and nexus to the protection of beneficial uses of the Merced River. The yardstick of providing adequate instream flows and water quantity is measured by the success (or lack thereof) of downstream aquatic resources. The one aquatic resource in the Merced River that has been measured and studied more adequately than any other is the fall-run Chinook salmon population. This species is the “canary in the coal mine” for determining the ecological health of the Merced River. The Merced River fall-run Chinook salmon population has declined precipitously over the past decade, so much so that natural resource trustee agencies are concerned with its possible extinction. Historically, an extremely large population of escaping (i.e., spawning) adults was reported Merced River, prior to the construction of the Exchequer Dam. Early residents of Merced and Mariposa Counties reported huge runs of salmon migrating upriver to spawn in summer and fall, “so numerous that it looked as if one could walk across the stream on their backs” (Clark, 1929). This number became reduced severely, coincidentally with, and in part caused by, water diversions and dams that were developed and operated on the Merced River by the applicant. Without fishery protections, the population of Merced River Chinook salmon declined and by the early 1960’s was in the less than 100 adult returns. Construction of the Merced River Fish Facility and some instream habitat enhancement reversed that trend in the early 1970’s. There was another sharp decline of the population in the mid-1990’s and the population increased up to 2000, where it, again, reversed the trend and has declined back to a few hundred adults in 2008. This decline, both overall and when dissected into various life-stage survival components, very strongly correlates with lack of Merced River flow during critical salmon life-stages. In 1997, a record high water year produced substantial project spill, essentially rendering insignificant the fishery effects of Project 2179 water operations, as well as the effects of some of the out-of-tributary (downstream) influences on juvenile salmon survival during that year. Absent those controlling influences, the salmon experienced much greater juvenile survival and downstream migration success. Accordingly, in 2000, when most of these fish returned to the Merced River as adults, runs were well in excess of 13,000 adult fish. Stated very simply: when there is abundance of water in the Merced River, there are more fall-run Chinook salmon, but never close to the numbers of salmon that occurred before the Project was built. New Exchequer Dam and its reservoir regulate the quantity of water and instream flows for the Merced River. Unfortunately, that huge water year runoff benefit was short-lived. Since 2000, and after normal Project 2179 operations resumed (including FERC instream flow requirements), the Merced River salmon escapements have sharply declined (see Table 7.3.3-5, PAD). As of 2008, the Merced River escapement population has plummeted to about 438 returning adults. This

represents more than an order-of-magnitude salmon population reduction from the past decade, during the time when Environmental Water Flows and other “protective conditions” under agreements between applicant and other agencies were in full effect (Vernalis Adaptive Management Plan, Bureau of Reclamation Water Purchase Agreement, CDFG/MID Memorandum of Understanding, and Davis-Grunsky Agreement). The Merced River population of fall-run Chinook salmon has declined, even with the full operation of a mitigation hatchery, Merced River Fish Facility, to supplement and enhance the wild population. Fishery scientists are studying several factors or controllers thought to affect the population: i) by an array of limiting factors within the Merced River, ii) by limiting effects of water operations, water quality, temperature and other parameters within the downstream San Joaquin River and Delta, and iii) by oceanic mortality, including sport and commercial angling. Separating the quantitative effects of these various population controllers presents a challenge, given the limitation of being only able to observe and measure salmon success at the earliest (i.e., fry-smolt) and latest (i.e., escapement) stages. The evidence strongly suggests that these salmon populations are substantially controlled (and adversely affected) by in-tributary limiting factors, rather than oceanic or other downstream controlling features. The primary factors (flow and related effects) controlling the salmon population in the Merced River are located within the reach of the River (i.e., immediately downstream of Crocker-Huffman), which is operated within the influence of Merced River Hydroelectric Project operations. Some have asserted that downstream factors within the San Joaquin River and Delta are principally responsible for the observed salmon population declines. It is apparent from the studies in the Merced River, confirmed by observations in other San Joaquin River tributaries, that the applicant’s operations and control of water quantity and instream flow play a strong role in those mortality factors, within an area outside the defined “FERC Project Boundary, but within the “active area” for conducting study and analyses of environmental impacts or effects. CDFG (2005) modeling study of salmonid survival in the San Joaquin River concluded: The Department evaluated various parameters that have been identified as influencing abundance of escapement of fall-run Chinook salmon into the SJR, such as ocean harvest, Delta exports and survival, abundance of spawners, and spring flow magnitude, duration and frequency. The Department found that the **non-flow parameters have little, or no, relationship** to fall-run Chinook salmon population abundance in the SJR and that **spring flow magnitude, duration, and frequency all had significant influence** upon SJR fall-run Chinook salmon abundance in the SJR. Conservation Committee is of the opinion that the preponderance of evidence supports the fact that the Merced River Hydroelectric Project has a direct effect on instream flows and water quantity in the Merced River below the FERC Project Boundary, as well as below the Crocker Huffman Diversion Dam. We request that FERC include an environmental assessment and alternatives study to evaluation of instream flow and water quantity management in the Merced River for the FERC relicensing.

Need for Additional Information. The applicant believes that two pieces of information would be useful: a comparison of regulated and unimpaired hydrology at the Project dams and development of a Project water balance/operations model would be useful. Conservation Committee believes that implementation of the AFRP Phase III would

provide alternatives and management options for improving the hydrology (and temperature) for instream flow and fisheries projections and recommends a Study that incorporates the engineering structural and managements goals for temperature control from AFRP Phase III be included in the Studies.

8.2.2.2 Issue WR-2 – Effect of the Project on water flow in the Merced River

Potential Effects. See Conservation Committee comments on 8.2.2.1 regarding potential effects of the Project on water flow.

8.2.2.3 Issue WR-3 – Effects of Project and Project recreation on water quality (excluding water temperature), and compliance with Basin Plan Standards.

Potential Effects. The applicant identifies two potential effects (dissolved oxygen depletion and increased metal concentrations and methylation of metals (e.g., mercury) as direct effects of the project. Applicant opines that there is a greater likelihood that a direct effect will be at Lake McClure, than at Lake McSwain. Applicant does not mention indirect or cumulative effects within the FERC Project Boundary “footprint”, nor any downstream effects in the “action area” of the Project. The water temperature issue is found at Issue WR-4, section 8.2.2.4, not section 8.2.2.2. Conservation Committee was unable to locate Section 4.2.10 describing Basin Plan Standards applicable to the Project.

With respect to effects of metals (e.g., mercury) on aquatic resources and beneficial uses in the Project Boundary, the applicant correctly identifies this as an issue. The operation and regulation of lake storage may affect the potential for increased metal concentrations in water, sediment, and biota; this has been clearly identified as a possible risk to the aquatic environments in a great number of studies elsewhere (Balistrieri *et al.* 2007). Applicant has not identified the type of effect that increased metal contamination would be. Conservation Committee suggests that it would be a direct effect on the aquatic resources (such as fish), as well as the use of that resource (fish contamination), within the FERC Project Boundary and action area. If there is significant mobilization of mercury into sediments, biota, and water within the FERC Project Boundary, the transport of those media downstream into the Merced Falls Dam reservoir, and beyond into, and past the Crocker-Huffman Diversion Dam would be highly likely, and have a direct effect on aquatic resources (such as fish and benthic macroinvertebrates) and the use of those resources (fish contamination). Another water quality issue that is present within the FERC Project Boundary and action area is “Unknown Toxicity”. The identification of this toxicity in RWQCB 303(d) draft listing announcement is specific to the Merced River from McSwain Reservoir to the San Joaquin River, and based upon monitoring data from the Surface Water Ambient Monitoring Project (SWAMP). The potential range (http://www.swrcb.ca.gov/rwqcb5/water_issues/tmdl/impaired_waters_list/303d/index.shtml) of direct effects from the release of unknown toxicity would likely within the FERC Project Boundary and the “action area” downstream of that boundary.

Need for additional information - The applicant identified no information or data on the extent of mercury contamination or presence of toxicity within the FERC Project Boundary, no downstream of the FERC Boundary, admitting that there are “little or no data on metals”. The applicant’s recommended study (Study 2.3) does not adequately address the mercury mobilization issue in the three environmental compartments, as well as document the risks and effects to aquatic resources and human health. No studies on the distribution of unknown toxicity are proposed by the applicant. Whilst there are no data, nor identified point source discharges of toxic materials within the project, there cannot be an assessment made on the effects or potential effects of “Unknown Toxicity” from operation, construction, and maintenance of the FERC Project because there are no data. In the amended PAD or a separate report to FERC, applicant should submit Study Plans to characterize existing water quality conditions in Project reservoirs and Project – affected reaches of the Merced River, including mercury toxicity and bioaccumulation, human health risk assessment, and distribution or presence of toxicity, as defined within the SWAMP monitoring protocols.

8.2.2.4 Issue WR-4 – Effects of the Project on water temperature, and compliance with Basin Plan Standards

Potential Effects. The applicant indicates potential water temperature effects may have a greater likelihood to be direct effects in Lake McClure, and indirect and cumulative effects can occur downstream. The report does not contain a Section 4.2.10, Basin Plan Standards applicable to the Project. Conservation Committee is of the opinion that temperature effects and instream & water quantity effects cannot be separated. Simply, higher instream flows downstream of the Project directly cause improved temperature profiles and areas affected in the lower Merced River (below Crocker Huffman Diversion Dam), and, in turn, improve conditions for “tailwater” anadromous fish populations, and benthic invertebrate communities in the Merced River between Crocker Huffman Diversion Dam and RM 42. Applicant’s temperature profile maps (Figures 7.2.9-5 through 7.2.9-8) are evidence of differences in temperatures by season and river miles. Spring and summer temperatures below River Mile 42 exceed those that trout and salmon can survive. This is a direct effect on the viability and survivability of the anadromous fish populations in the environmental assessment “action area.” Our previous discussion and analysis in Section 8.2.2.1 Issue WR-1 is applicable here as well.

The applicant outlines the general steps of the USFWS Anadromous Fisheries (sic) Restoration Program Water Temperature Management Feasibility Study. This is a 4-phased study that was started in 2001: Phase I and II have been completed and the results published. Phase III and IV are pending. It is not clear whether or not they will be completed in time to include the results, recommendations, and conclusions in the development of the new FERC license in 2014. Applicant states that the temperature model “would be a useful tool to inform license requirements” and “could be used to simulate reservoir and stream temperatures based on reservoir operations”. Conservation Committee recommends that FERC have the applicant determine the process and scheduling of the completion of the Phase III and Phase IV Feasibility Studies. If they cannot or will not be available in time to include the results and recommendations into the 2014 License, FERC should include those studies in the Study Proposals. The

applicant states that the only information need is to develop the water temperature model (which appears to have already been accomplished by the AFRP). The deficiencies in the licensee's proposed studies and recommendations are that they can only model the operation of the constructed facilities in their current configurations, and applicant has not evaluated alternatives to allow flexibility and conservation of water resources (temperature) in their study Proposal. To address these issues, Conservation Committee recommends that the feasibility studies for hydrologic alterations include the following elements to improve Water Temperature Management for "tailwater" anadromous fish populations: a) modification of the New Exchequer Dam Intake Structure (allow options for water removal at different reservoir elevations); b) direct conveyance of cold water from New Exchequer Dam to immediately upstream of area that are volitionally accessible by anadromous fish; c) modification of Crocker Huffman Diversion Dam (= removal) and construction of new intake for main canal at Merced Falls Dam or below McSwain Dam; d) modification at Merced Falls Dam (PGE dam) to provide anadromous fish passage, such as truck and trap; e) improvement of habitat between Merced Falls and McSwain Dams for spawning and rearing of anadromous fish; f) improvement of habitat between Merced Falls and Crocker Huffman Diversion Dam for spawning and rearing anadromous fish; and g) improvement of coldwater supply for Merced River Fish Facility and Supplementation Conservation Hatchery.

8.2.2.6 Issue WR-6 - Effect of Project on Compliance with TMDL Schedule

8.2.2.7 Issue WR-7 - Effect of the Project on Merced ID's water transfers.

Potential Effects. Both of these issues have significant direct effects on the protection of "tailwater" anadromous fish, i.e. Steelhead trout and fall-run Chinook salmon. Conservation Committee has no comment on whether applicant needs more information or data to address the issue fully in the environmental assessments or consultations with regulatory agencies. We defer to those agencies with regulatory responsibilities for these issues (USDOC, USDO, CDFG, SWRCB), and presume they will exercise their authorities and address the issues for protection and enhancement of anadromous fish during the Relicensing proceeding, as appropriate.

8.2.2.8 Issue WR-8 – Effect of global warming on water supply and storage.

Potential Effects. Applicant states that there is no potential effect because the issue does not have a project nexus and is outside the scope of relicensing. As a planning and operations issue, natural resource trustee agencies are evaluating this issue with respect to their statutory authorities. Climate change in the Central San Joaquin Valley may have enormous impacts on Merced River water supply in future years. Conservation Committee has additional comments at Section 3.2 Climate, above.

8.2.3.1 Issue AR-1 – Effect of the project on special status coldwater fishes in the Merced River watershed

Potential Effects. Applicant states that the Project can have direct effects on coldwater fishes in Project reservoirs, and can have indirect and cumulative effect on fishes in the section of the Merced River between Merced Falls Dam and Crocker-Huffman Diversion Dam due to changes in Project releases. Four special status fishes occur in the Merced River in and below the FERC Project Boundary: Kern Brook lamprey, Central Valley fall- and late fall-run Chinook salmon, hardhead, and Sacramento splittail. There are only reasonably accurate information and data on the salmon populations and the effects of river flow-temperature-habitat, as discussed in Section 8.2.2.1. It is more likely than not, that the other three special-status coldwater species will be positively, or negatively, affected by the changes and amounts of Project releases. These direct effects are the results of project operations and maintenance. Conservation Committee believes that there is clear evidence that controlling factors affecting Chinook salmon populations are, have been, and will continue to be, directly associated with Project operations, maintenance, and construction that occur outside the designated FERC Project Boundary, and downstream to “tailwater” aquatic habitat, that occurs below the Crocker Huffman Diversion Dam. No additional information on these species will be collected by the applicant’s fisheries studies.

8.2.3.2 Issue AR-3 – Effect of the Project due to entrainment into Project intakes.

Potential effects. Applicant states that the intakes have a potential to have direct effects on fish populations from which the fish are entrained. Conservation Committee agrees with this statement, and has no objection to applicant conducting fish population studies in their reservoirs.

Conservation Committee points out that the impact of entrainment might become a very important issue in re-establishment and re-population of anadromous fish species, by providing bypass and access to upper Merced River habitat. If a restoration project for enhancement of an anadromous fish population in the upper Merced River, there will be additional consideration for the project effects with respect to entrainment.

8.2.3.7 Issue AR-7 – Effect of the Project on trout and salmon upstream of Lake McClure including populations and fishing.

Potential Effects. It is possible that the applicant is interpreting this issue differently than others. The operation for the storage of water in Project reservoirs provides habitat for coldwater fishes (state in 8.2.3.1, Issue AR-1). Barriers to fish migration out of the reservoir, into the upper Merced River, limit reproduction opportunities for spawning and rearing opportunities for current resident Rainbow trout and resident Chinook salmon in Lake McClure. This may have a direct effect on the ability of resident fishes to migrate upriver (or downriver) for reproduction. Applicant has agreed to investigate stream barriers at the lake-river interface. What has not been agreed to is evaluation of alternatives to stream barrier management, should it be identified as a controlling factor for spawning resident Rainbow trout and resident Chinook salmon. Conservation Committee points out that the impact of fish bypass might become a very important issue in re-establishment and re-population of anadromous fish species, by providing to upper

Merced River habitat. If a restoration project for enhancement of an anadromous fish population in the upper Merced River, there will be additional consideration for the project effects with respect to fish bypass in Lake McClure. The presence of a barrier between the lake and river might have a direct effect on the ability of anadromous fish to migrate upriver for reproduction.

8.2.3.8 Issue AR-8 - Effect of the Project on special-status fishes, especially fall- and late fall-run Chinook salmon (NMFS Species of Concern), due to the blockage of passage

8.2.7.5 Issue T&E-5 – Effect of the Project (e.g., physical barriers) on upstream and downstream migration of ESA- and CESA-listed anadromous fishes, including spring-run Chinook salmon (FT and CT) and Central Valley steelhead (FT)

Potential Effects. Applicant asserts that there are no project effects on anadromous fish simply because they are blocked from upstream migration by Crocker-Huffman Diversion Dam and can't (currently) attain the FERC Project Boundary. All four dams act in concert (and have for 83 years) to block volitional anadromous fish passage. With a proper and maintained fish passage devise, it is possible for anadromous fish to volitionally pass Crocker Huffman Diversion and Merced Falls Dams; it is not possible for anadromous fish to pass McSwain or New Exchequer Dams. Just as with the issue of instream flows and water quantity (Issue WR-1), the applicant takes a limited view that the downstream dam (not regulated by FERC) is the only potential effect, and it is not within the FERC License Boundary. It is the control of instream flows by the applicant that cause direct impacts on anadromous fish populations in the "action area", below the FERC Project Boundary as described above in Issue WR-1. If unchanged, the direct Project effects that have continued since original construction, will continue if the Project is operated in the same fashion as it has been under the old license. It simply blocks anadromous fish passage, as do all of the dams downstream of the FERC Project Boundary do now. At no time since construction, has the Project allowed volitional anadromous fish passage on the Merced River. Clark's 1929 report clearly identified the direct effects of Exchequer Dam blocking (and depleting) salmon:

“...there are three obstructions that affect the salmon. The Crocker Huffman irrigation diversion dam near Snelling is the lowermost. This dam, which was built about 1918, is about 15 feet high and has a good working fishway in high water. There are a few screens but not over all the ditches. At Merced Falls there is a natural fall and a 20-foot dam has been constructed to generate power for a sawmill. The dam was built prior to 1913. There is a fishway, but it has been closed and out of order for a number of years. There are screens over the intakes to the power house. The Exchequer Dam is about 20 miles above the Merced Falls and is impassable to fish. It is a 120-foot power dam.”

The construction of the Exchequer Dam between 1924 and 1926 permanently stopped anadromous fish passage in the Merced River, and the direct effects have continued with

the construction of the New Exchequer Dam and the McSwain Dam. Anadromous fish are unable to bypass those dams, as well as the dams downstream. These are direct effects to these anadromous fish populations that inhabited the river before the Project, including Steelhead rainbow trout, spring-run Chinook salmon, and fall-run & late fall-run Chinook salmon. The Project extirpated the spring-run Chinook salmon, severely depleted the Steelhead rainbow trout, and severely reduced the population of fall-run & late fall-run Chinook salmon, probably in the same manner as Friant Dam did on the San Joaquin River. The only probable reasons that the fall-run and late-fall-run Chinook survived in a reduced population was that there was limited habitat to allow reproduction in the lower portion of the Merced River basin, and it has a life history strategy that doesn't include over-summering in the Central Valley. The direct project effect is the long-term continuous and uninterrupted anadromous fish blockage from the Project for the past 83 years, without provision for volitional fish passage or mitigation (for Steelhead trout or spring-run Chinook salmon), resulting in the extirpation of one population of salmon, the severe depletion of Steelhead rainbow trout, and the reduction of fall-run and late fall-run Chinook salmon, that originally began with the construction of the Exchequer Dam, whereas downstream diverters provided for anadromous fish passage.

Existing Information. Applicant has indicated that it believes that there is existing information on this issue, and there is not a need to provide additional information. Conservation Committee disagrees with applicant's assessment, and believes additional evidence and study is needed to evaluate the feasibility of providing volitional fish passage to reconnect anadromous fish populations that have been blocked from attaining their spawning and rearing habitat in the upper Merced River Basin. Conservation Committee has appended two Study Requests, entitled Upper River Fish Populations & Anadromous Fish Passage (Appendix A) to be considered by FERC for inclusion in the Project Proposed Study Plan [18 CFR § 5.9 (b.)]. Conservation Committee attempted to comply with all of study criteria and adherence to these criteria in formulating study requests to develop our study plans [18 CFR § 5.11 (b)-(e)]. We apologize for any omissions or errors, and hope that FERC understands the urgency of the process may have cause us to introduce inadvertent errors that we will gladly correct in further collaborative participation in the Relicensing process. We request FERC afford us the opportunity to address or corrections of any concerns, issues, or shortfalls in the Study Request process that this short response time may have caused.

8.2.7.1 Issue T&E-1 - Effect of Project on the federal Endangered Species Act (ESA)- and the California Endangered Species Act (CESA)-Listed anadromous fishes due to water temperature

8.2.7.2 Issue T&E-2 – Effect of Project on ESA- and CESA-Listed anadromous fishes, due to attraction flows

8.2.7.3 Issue T&E-3- Effects of the Project on ESA- and CESA-Listed anadromous fishes, adult holding habitat, juvenile holding habitat, and spawning habitat

8.2.7.4 Issue TE&E-4 – Effect of the Project on ESA- and CESA-Listed anadromous fishes due to stranding

Potential Effects. Applicant states that the potential effects are none, except for the effect of water temperature which is classified as a cumulative effect. As described in parallel and overlapping Issues (WR-1 and T&E-5), Conservation Committee disagrees with the applicant's views and believes the maintenance, operation, and construction effects of the Project have had, and will continue to have, direct effects on existing "tailwater" populations of anadromous fish and benthic communities that support those populations, as well as potential direct effects on restored populations of anadromous fish if they are re-connected to their original spawning and rearing habitats above the FERC Project Boundary.

Existing Information. None of the ESA-listed fishes have received any studies or evaluations with respect to water temperature, attraction flows, adult holding habitat, juvenile holding habitat, spawning habitat, and stranding as referred by applicant in Sections 7.2 and 7.3. The sections that the applicant referred to are simply general compilations of water resources and aquatic resources that exist or may exist in the FERC Project Boundary or MID defined "Project Vicinity". Additional information that is needed is to develop water temperature conditions and alternatives to protect ESA-listed species (Steelhead trout) in the Merced River (instream flow requirements). This needs to be evaluated with respect to temperature and instream flow in relation to conditions that currently exist (and have not allowed maintenance or re-establishment of a "good" Steelhead trout population), document temperature habitat preferences of critical life stages of Steelhead trout, assess baseline juvenile *O. mykiss* abundance and distribution, assess the population structure, assess habitat type utilization, develop a monitoring protocol to evaluate juvenile population structure and habitat type utilization, investigate the relationship between physical features within habitat types and location of steelhead, develop a baseline with which to compare available habitat and fish populations under different flow regimes, and confirm *O. mykiss* anadromy lineage and population distributions of the Merced River. Conservation Committee has appended one Study Request, entitled Juvenile Steelhead Habitat (Appendix A). A second study, entitled Upper River Fish Populations, evaluates *O. mykiss* anadromy lineage and potential Steelhead reproduction and juvenile habitat (Appendix A). We recommend that FERC consider inclusion of these Study Proposals in the Project Proposed Study Plan [18 CFR § 5.9 (b.)].

8.2.7.17 Issue T&E-17 Effect of CDFG's Merced River Fish Hatchery on anadromous fishes

Potential Effects. The applicant states that the CDFG's Merced River Fish Hatchery is not a Project facility. This is correct. The issue that was suggested in the Licensee-Sponsored Issue Identification Meetings was to address the feasibility of developing a Conservation Hatchery to mitigate for Project direct effects on the severely depleted Merced River Steelhead trout population, along with other conservation measures, as recommended by NMFS, and supported by CDFG.

Need for Additional Information. The goal of the anadromous fish restoration is to provide a self-sustaining, networked *O. mykiss* population composed of wild, indigenous strains, established in interconnected habitat, i.e., in streams, lakes, mainstem and suitable tributaries of the Merced River basin. It includes enhancing connectivity between suitable spawning and rearing habitats to support natural reproduction and recruitment, by including anadromous fish bypass opportunities at artificial and natural barriers of the river. It also includes a conservation hatchery to accelerate the re-population efforts. The specific information needs for the project include: a) review and evaluation of existing facilities for conservation hatchery, b) feasibility of constructing new facilities, c) feasibility of Merced River Steelhead trout supplementation, d) environmental compliance evaluation for the Merced River Steelhead Trout Conservation Hatchery, and e) develop a hatchery management plan with a genetic component.

Section 9 Existing and Licensee Proposed Measures

9.3.2 Flow-related Articles in Existing License Not Proposed by Licensee.

Applicant states that it feels that it is premature to speculate as to what flow-related measures will be needed or appropriate until a final list of issues to be addressed is developed through the FERC's NEPA process. Conservation Committee has no objection to waiting until that process has been completed to develop flow-related PM&E Measures. Conservation Committee notes that Articles 40 and 41 have been in place for almost 50 years, and it is clear that they are inadequate to protect anadromous fish populations, along the habitat and instream flows to support and enhance those populations, as they were developed only to meet downstream riparian water rights, with no considerations for environmental flows. A second, and more urgent issue is the catastrophic collapse of anadromous fish populations in the Merced River, indicating a serious need to develop protective flow-related PM&E measures and Permit Articles in the 2014 FERC permit.

Section 10 Licensee's Preliminary Proposed Studies

10.2 Preliminary Proposed Studies

Conservation Committee has specific comments on the following applicant studies; 2.1 Hydrologic Alteration; 2.2 Water Balance/Operations Model; 2.3 Water Quality; and 2.4 Water Temperature Model

Study 2.1 Hydrologic Alteration

This study addresses issues of instream flow and water quantity downstream of Crocker Huffman Diversion Dam and the rest of the Merced River. The applicant's study proposal focuses on the issue of flow management to address goals of two agencies with jurisdiction over water resources: SWRCB and CDFG. It is unclear how the information and data collected in this study will have a nexus with compliance with SWRCB and

DFG applicable laws and regulations. Do CDFG and SWRCB accept an IHA analysis as sufficient to meet their regulatory obligations? What instream flow requirements are going to be needed to protect designated “critical habitat” for Steelhead trout, and how does the IHA analysis provide for that need?

Conservation Committee believes that implementation of the AFRP Phase III study would provide alternatives and management options for improving the hydrology (and temperature) for instream flow and fisheries projections (Issues WR-1 and WR-2). Conservation Committee recommends that the feasibility studies for hydrologic alterations include the following elements to improve Water Temperature Management for “tailwater” anadromous fish populations: a) modification of the New Exchequer Dam Intake Structure (allow options for water removal); b) direct conveyance of cold water from New Exchequer Dam to immediately upstream of area that are volitionally accessible by anadromous fish; c) modification of Crocker Huffman Diversion Dam (= remove) and build new intake for main canal at Merced Falls Dam or below McSwain Dam; d) modification or removal of Merced Falls Dam (PGE dam) to allow anadromous fish passage; e) improvement of habitat between Merced Falls and McSwain Dams for spawning and rearing of anadromous fish; f) improvement of habitat between Merced Falls and Crocker Huffman Diversion Dam for spawning and rearing anadromous fish; and g) improvement of coldwater supply for Merced River Fish Facility and Supplementation Conservation Hatchery.

The study results may be utilized to change facilities, operations, and management activities. Applicant indicates that these may be in the form of modification of operational procedures or reservoir intakes and outlets. Conservation Committee carefully reviewed Study 2.1 and was unable to find reference to how modification of reservoir intakes and outlets was to be evaluated and implemented. Conservation Committee recommends that FERC includes the above 7-element operational and reservoir (= dams) modifications for improvement to instream flow and water quantity issues downstream of the Crocker Huffman Diversion Dam and the rest of the Merced River in Study 2.1.

Conservation Committee apologizes for not having enough time to develop and submit a modified Study Plan for this study because of the demanding deadlines for responding to SD1, PAD, and Study Requests. Conservation Committee will continue to work with the applicant in modifying Study 2.1 to address Conservation Committee’s issues and recommendations described above.

Study 2.2 Water Balance/Operations Model

It is somewhat obscure as to what this “water balance/operations model will do. It doesn’t address actions for the purpose of protecting or mitigating impacts to environmental resources that result from the Project or enhancing resources that are affected by the protect. Its’ potential license condition is “the water balance/operations

model will inform the development of license requirements.” Conservation Committee doesn’t understand what this means.

To address Issues WR-1 and WR-2, a water balance/operations model should allow the applicant to best manage water supply for: instream flow and water quantity (including temperatures) downstream of Crocker Huffman Diversion Dam, and for the rest of the Merced River. Rather than develop a model (which Conservation Committee believes has already been developed), Conservation Committee believes the water balance model should be addressing the issue of future Merced River water supply, changing environmental conditions due to weather pattern changes, water needs/uses such as environmental enhancement flows, and changing hydrographic conditions in the future. The current model proposal simply calibrates past flows and is used to passively predict daily outflows at points below the FERC Project Boundary. This is a useful exercise, but the model exists, so why not test it for sensitivity for and application in the Merced River, and move on to the more important issues of temperature management/controls, instream flow needs, water production and, water demands in the future.

Many predict significant effects of climate change on Central Valley Rivers in the coming years. Climate change analyses using PCM and HadCM3 climate models for lower (B1) and higher (A1fi) emissions scenarios predict mid-century (2020-2049) increases to annual statewide air temperatures to range from 1.35°C (2.34°F) to 2.0°C (3.6°F) (Hayhoe *et al.* 2004). At this range of temperature increases, the Merced River watersheds may experience significant reductions in the spring melt hydrograph due to relatively low elevation headwaters (after Knowles and Cayan 2002, 2004). While total precipitation is not anticipated to change, a shift in the form of precipitation from snow to rain will increase winter runoff, reduce snow pack and reduce spring season runoff (Hayhoe *et al.* 2004, Knowles and Cayan 2002, 2004). Snow pack (snow water equivalent, SWE) loss projections for mid-century (2020-2049) are 45-55% loss at 7200’, 68-80% loss at 5900’ and 80-90% loss at 4,600’ (Hayhoe *et al.* 2004). Increases in mean air temperatures and the loss of spring through summer discharge will undoubtedly raise stream temperatures in the Merced River watershed. Stream temperature increases can have serious implications for Threatened and Endangered anadromous salmonid habitats in the Merced River and the few remaining tributaries that support wild native production in the upper watershed. The implications of summer stream temperature increases must be considered and evaluated for the remaining salmonid anadromous fish populations. Conservation Committee apologizes for not having enough time to develop and submit a modified Study Plan for this study because of the demanding deadlines for responding to SD1, PAD, and Study Requests. Conservation Committee will continue to work with the applicant in modifying Study 2.2 to address Conservation Committee’s issues and recommendations described above.

Study 2.3 Water Quality

This study focuses on potential Project effects to water quality.

Conservation Committee believes that the study plan has two significant deficiencies that may not allow it to fully address Issues (WR-3 and WR-6) for which it was designed. Conservation Committee's technical comments on WR-3 and WR-6 are found above at 8.2.2.3 and 8.2.2.6. At a Study Proposal meeting, Conservation Committee supported the idea to include mercury monitoring for two reasons: potential impacts to ecological receptors and to human receptors. Discussion at the meeting only focused upon potential mercury impacts to humans, i.e. SWRCB would contact OEHHA and find out if they needed further information. The mobilization of Hg into the aquatic food web was not discussed. There was no vote or other indication of participant's positions, other than a general statement "can everyone live with this?"

With respect to the toxicity issue, this is a routine SWRCB constituent, just like dissolved oxygen concentration or turbidity. How the toxicity constituent would not be relevant to the nexus of the project and how oxygen concentration would not be explained.

Conservation Committee does not agree with the Water Quality Study Plan because the plan excludes two important constituents that may be developed into TMDLs in the future, and thus have a possible direct effect upon Project Maintenance and Operations.

Conservation Committee recommends inclusion in the study plan the water quality parameters of mercury and toxicity. In the amended PAD or a separate report to FERC, applicant should submit Study Plans to characterize existing water quality conditions in Project reservoirs and Project-affected reaches of the Merced River, including mercury toxicity and bioaccumulation, human health risk assessment, and distribution or presence of toxicity, as defined within the SWAMP monitoring protocols. Conservation Committee apologizes for not having enough time to develop and submit a modified Study Plan for this study because of the demanding deadlines for responding to SD1, PAD, and Study Requests. Conservation Committee will continue to work with the applicant in modifying Study 2.3 to address Conservation Committee's issues and recommendations described above.

Study 2.4 Water Temperature Model

This study addresses two issues related to the effect of project on water temperature (WR-4) and effect of project on endangered species (T&E-1).

Conservation Committee believes that a HEC-5Q model has already been developed and calibrated for the Merced River. The study proposal lacks an operational and implementation element. To put simply, the study as proposed to model temperatures in the Merced River for environmental enhancements, but there is no mechanism for altering water temperatures other than the method that has been used (unsuccessfully) to date. Conservation Committee is interested in pursuing the application of a more robust model for temperature modeling in McClure Reservoir. The HEC-5Q model is a two-

dimensional model, and there are other three dimensional models available that may give more accurate temperature predictions for the project.

Because of the morphology of the McClure Reservoir, there could be a limitation of using the HEC-5Q is its inability to model sloping riverine waterbodies, which may be resolved with other models, such as CE-QUAL-WQ. One issue is that the HEC-5Q models incorporate a one-dimensional, longitudinal river model with a one-dimensional, vertical reservoir model (one-dimensional for temperature and water quality and zero dimensional for hydrodynamics). The modeler must choose the location of the transition from 1-D longitudinal to 1-D vertical. Besides the limitation of not solving for the velocity field in the stratified, reservoir system, any point source inputs to the reservoir section are spread over the entire longitudinal distribution of the reservoir layer.

If applicant is firm on continuing to develop a Project temperature model, Conservation Committee believes it should evaluate more than just the HEC-5Q model. Conservation Committee recommends that the feasibility studies for hydrologic alterations include the following elements to improve Water Temperature Management for “tailwater” anadromous fish populations: a) modification of the New Exchequer Dam Intake Structure (allow options for water removal); b) direct conveyance of cold water from New Exchequer Dam to immediately upstream of area that are volitionally accessible by anadromous fish; c) modification of Crocker Huffman Diversion Dam (= remove) and build new intake for main canal at Merced Falls Dam or below McSwain Dam; d) modification or removal of Merced Falls Dam (PGE dam) to allow anadromous fish passage; e) improvement of habitat between Merced Falls and McSwain Dams for spawning and rearing of anadromous fish; f) improvement of habitat between Merced Falls and Crocker Huffman Diversion Dam for spawning and rearing anadromous fish; and g) improvement of coldwater supply for Merced River Fish Facility and Supplementation Conservation Hatchery. Conservation Committee apologizes for not having enough time to develop and submit a modified Study Plan for this study because of the demanding deadlines for responding to SD1, PAD, and Study Requests. Conservation Committee will continue to work with the applicant in modifying Study 2.4 to address Conservation Committee’s issues and recommendations described above.

10.3 Potential Studies Requested by Relicensing Participants

The applicant included a list of “Relicensing Participant requested studies” in the PAD (Page 10-5 and 10-6), including a list of anadromous fish-related studies. Several of those issues were summarized by Conservation Committee, but requested by others (Eric Theiss, NMFS, in the PAD-Information Gathering Meeting, July 23, 2008): historical extent of anadromy by a fish passage barrier analysis, including upstream of Lake McClure; estimate of number of anadromous fish that would be produced by the watershed without the Project, year-round water temperatures from Old River confluence to the historical extent of anadromy; potential for recreating the same numbers and life-history types of anadromus fishes in the lower river through natural production; potential for passage of fish from downstream to upstream of Lake McClure; effect of existing hatchery on natural populations; implementation of a state of the art

mitigation/conservation hatchery; amount of water diverted from the Merced River through project and non project structures; and potential to reduce water diversions through conservation measures. Along with CDFG, Conservation Committee supports these NMFS-recommended issues/studies. Conservation Committee supports those actions that will lead to the restoration and enhancement of historically-occurring anadromous fish populations in the Merced River. At the present, Conservation Committee is unaware of further Agency recommendations on anadromous fish and information needs.

Conservation Committee issues/studies were supplied to the Applicant in March, 2007 with Report and a letter requesting to initiate cooperative development of the Pre-Application Document and Study Requests. These issues/information needs were: inventory of habitat and distribution of fish upstream from Lake McClure/McSwain Complex, evaluation of project effects on non-fish aquatic resources, evaluation of fisheries management on project fisheries, evaluation of Upstream Barriers to salmonid migration; evaluate fish species distribution of Lake McClure/McSwain Complex and Merced River, evaluate alternatives for fish passage (protected species); evaluate conservation and mitigation hatchery operations, evaluate downstream impacts associated with McClure/McSwain on Merced Hatchery Operations; evaluate feasibility of Merced River hatchery as a conservation hatchery; evaluate existing Merced River environmental enhancements (CalFed, AFRP, CDFG-MID). Many of these issues are overlapping recommended issues by NMFS, CDFG, and Conservation Committee representatives. Conservation Committee continues to recommend the development of studies to address the over-arching issue of maintenance and restoration of “good” populations of anadromous salmonids in the Merced River, above and below FERC Project Boundaries. Conservation Committee has attached study proposals that address those issues and recommends that FERC include those studies in their study plan determination (18 CFR § 5.13 c). Conservation Committee is available to consult with FERC or the applicant at their convenience on further needs/questions regarding the anadromous fish restoration issue and the Requested Studies.

3.0 INFORMATION REQUESTS

The following are information requests to FERC or the applicant in order to conduct and allow the development of an accurate and thorough analysis of the site-specific and “action area” effects of relicensing the Merced River Hydroelectric Project, as articulated in the Scoping Document 1.

- 1- **Endangered Species Act.** In a discussion in Section 4.1.2 of laws that apply to the project and how the applicant plans to comply with each of the major applicable laws (Page 4-1), the PAD states: “Section 7.7 discusses species listed under ESA and designated critical habitat...” (Page 4-3, para. 2). In Section 7.7 (at Section 7.7.2) the PAD identifies Steelhead, California Central Valley DPS (*Oncorhynchus mykiss irideus*), and Critical Habitat. The amended PAD should identify the limits of the *O. mykiss* critical habitat, identify how construction, continued operation, and maintenance of the project will, is, or may be affecting

critical habitat, and discuss alternative methods or means of providing protection, mitigation, or enhancement. Any impending or adopted Section 7 ESA Biological Opinion with reference to Merced River (e.g., NMFS, 2008) should be included in the PAD analysis. This should also be evaluated within the context of consistency with Comprehensive State and Federal plans (Section 5 of the PAD).

- 2- **Table 7.3.3-7.** The stated purpose of Section 7 is to “describe(s) the existing environment in the general vicinity of Merced Irrigation District’s (Merced ID or Applicant) Merced River Hydroelectric Project (Project)” (Page 7-1). The subject table (Table 7.3.3-7) is described as proving the study elements, study purposes, and duration for each study element within the CDFG and Merced ID 10-year program. The list of studies identified is incomplete (see Vogel 2003). These are the list of studies in the 2001 MID-CDFG MOA, with the missing studies highlighted in yellow:

Chinook Salmon Attraction into the Merced River
Annual Salmon Spawning Ground Surveys
Empirical Validation of Fish & Game's Instream Flow Recommendations for Salmon Spawning
Monitoring of Water Temp. During Egg Incubation
Evaluation of Chinook Salmon Spawning Substrate
Evaluation of the Contribution of Merced River Fish Hatchery to Catch and Escapement
Effects of Past Gravel Mining Activities and Predation of Chinook Salmon Fry
Empirical Validation of DFG's Instream Flow Recommendations for Juvenile Salmon Rearing
Rearing Habitat Structure Evaluation
Abundance of Natural Salmon Production
Hatchery Optimal Time and Size at Release
Transport Timing During Pulse Flow Events
Survival of Salmon Migrating from the Merced River
Temperature Management Reconnaissance Study
River and Reservoir Water Temperature Models
Temperature Management Feasibility Study
Lower Merced River Temp. Mgmt. Proposal
Steelhead Information Compilation
Adult Steelhead Presence
Watershed Assessment

The amended PAD should report and discuss the individual findings, conclusions, and recommendations of any of these studies that have been completed, along with a discussion of MID’s response to the recommendations.

In 2003, Vogel reported that MID and CDFG had agreed to conduct these studies to determine potential factors that may limit salmonid production in the Merced River in 2002. The data, information, conclusions, and recommendations to determine the

factors that limit salmonid production in the Merced River that have been collected to date should be included in the amended PAD. Other terms of the agreement included:

The following scope of work is intended to be an initial working document to identify the most important components for Merced River anadromous salmonid investigations. The emphasis will be on chinook salmon. The presence of steelhead in the Merced River is presently unknown and, therefore, portions of these investigations will include examinations of information and data potentially relevant to steelhead. As a working document, this scope of work is subject to change as new information is developed. In particular, it is expected that the Merced Technical Advisory Committee (MTAC) will review this scope of work and modify it as needed. It is important to recognize that additional work beyond that identified in this scope of work may be necessary, depending on results from the studies identified in Exhibit A. Many of the details necessary for each study (e.g., study protocols, sample sizes, costs, experimental design, etc.) will be developed by the MTAC.

It would appear that the agreement allowed the MTAC to review aspects of the scope of work and modify that scope of work. It would appear that additional work beyond that identified in the original scope of work might be necessary. The individual member of the MTAC, the information collected in the study, the recommendations of MID/CDFG, and the responses/ recommendations of the MTAC, on the MID-CDFG 10-year Memorandum of Understanding should be contained in the amended PAD. Of particular interest to the Conservation Committee are the Reports, Data, and Studies of Steelhead in the Merced River. Combined, this information will provide a more complete and transparent record of the existing, relevant, and reasonably available information regarding aquatic resources in the Merced River basin in the Project Vicinity.

3- Section 5.2 Non-Qualifying Comprehensive Plans and Agreements

The PAD (MID, 2008) included a number of Non-Qualifying Comprehensive Plans and Agreements that may be pertinent to relicensing. One of the identified plans has had subsequent changes since the PAD was issued (Delta Vision). The description and discussion of another plan omitted the agencies' goal and objective that has a nexus to the Project (BLM Sierra Resources Management Plan). Two additional plans (CDFG 2004 Trout Strategic Plan (CDFG 2003) and the San Joaquin River Restoration Project Plans) contain management, measures, practices, or activities that may involve effects or actions from the Merced River Hydroelectric Project (the Project).

Delta Vision. The final Delta Strategic Plan (2008) has been released that identifies and evaluates alternative implementing measures and management practices that would be necessary to implement Delta Vision recommendations. Issues such as

reconnecting the San Joaquin River by flow management, increasing San Joaquin River flows between February and June, providing short duration pulse flows in fall starting by 2015, establishing TMDLs by 2012 for all upstream areas for mercury, and improving statewide agricultural water efficiency are some of the measures that may have considerable future impacts on the operations of the Merced River Hydroelectric Project. The amended PAD should give a full documentation of the measures and alternatives in the final Delta Strategic Plan along with addressing alternatives for those measures with respect to the Project and its operations.

BLM Sierra Resources Management Plan. The amended PAD should include references to, and discussion of the BLM Resources Management of Fish and Wildlife, specifically the **goal** to maintain, improve or enhance native fish and wildlife populations and the ecosystems upon which they depend, along with the **objective** to: restore disturbed or altered habitat for all life stages of native wildlife species, aquatic species, macroinvertebrates, special status species, and native fish species, including **spawning fish passage habitat**.

CDFG 2003 Trout Strategic Plan. The purpose of this plan is to identify key issues and concerns relative to trout and inland salmon (e.g., Lake McClure) resources and fisheries in California, and to develop goals and strategies that will address these issues during the next 10 to 15 years and beyond. Its vision for the future includes a plan that enables trout managers to meet public trust responsibilities of protecting and maintaining California's rich heritage of native trout and other aquatic resources; a plan that promotes the use of sound ecosystem management principles; a plan that provides diverse angling and recreational opportunities; and a plan that increases the general public's appreciation and awareness of trout and their habitats. The amended PAD should give a full documentation of the measures and alternatives in the Trout Strategic Plan along with addressing alternatives for those measures with respect to the Project and its operations.

San Joaquin River Restoration Project Plans. These plans involve the restoration of anadromous fish on the San Joaquin River between Friant Dam and the Merced River junction. The documents identified have specific reference to issues, plans, activities, and information related to the Project.

The amended PAD should include references to, and discussion of the following specific elements of the San Joaquin River Restoration Project (SJRRP) Plans:

Spring-run Chinook salmon issue with Merced River. The SJRRP Technical Report (SJRRP TAC, 2007) contains recommendations required under the Settlement Agreement for coordinating releases from Friant Dam with **fishery restoration actions on the Merced**, Tuolumne and Stanislaus Rivers.

Fall-run Chinook salmon issue with Merced River. The nature of the Settlement flow regime indicates that it may be desirable to establish late-spawning (November-December) fall-run Chinook salmon from tributaries of the San Joaquin River (e.g., Merced or Tuolumne rivers), or use late fall-run Chinook salmon from the

Sacramento River that spawn between January and April. The (SJRRP TAC, 2008) TAC recognizes that a key issue will be the degree to which fall-run Chinook salmon “stray” into and/or from the Merced, Tuolumne, and Stanislaus rivers. Concern falls mainly into three areas: (1) in the initial years before the upper San Joaquin begins to substantially contribute to basin salmon production, periodic removal of the Hills Ferry Barrier to allow adults to stray into the upper San Joaquin River may reduce adult escapement from the tributaries, thereby potentially impacting mitigation requirements of water managers on those tributaries, (2) reduced adult brood stock returns and subsequent reductions in juvenile production from the Merced River Hatchery; and (3) upper San Joaquin adults straying into the tributaries such that upper San Joaquin River escapement targets will not be achieved. The degree of intervention for fall-run Chinook salmon from the upper San Joaquin River (restoration) should be less than late fall-run and spring-run based on the high likelihood of natural straying of existing fall-run adults from the Merced River, and possibly contributions from the Tuolumne and Stanislaus rivers.

Other San Joaquin River Restoration Project Planning Documents with direct nexus to the operations, maintenance and construction of the Merced River Hydroelectric Project are: 2007 Program Management Plan, 2007 (SJRRP 2007) Public Scoping Document for NEPA (SSRP 2007 a), 2008 Initial Program Alternatives Report (SJRRRP 2008), 2008 Conceptual Models of Stressors and Limiting Factors for San Joaquin River Chinook Salmon (SJRRP 2008 a). All of the subject plans are available at: <http://www.restoresjr.net/>

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APPENDIX A – STUDY REQUESTS

Conservation Committee Study Requests are attached as four (4) separate .pdf files to this comment letter on the PAD:

- Anadromous Fish Passage – March 1, 2009
- Juvenile Steelhead Habitat – March 1, 2009
- Upper River Fish Populations – March 1, 2009
- Anadromous Conservation Hatchery – March 1, 2009

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