

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426

OFFICE OF ENERGY PROJECTS

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

December 22, 2009

Mr. Geoff Rabone
Deputy General Manager
Merced Irrigation District
P.O. Box 2288
Merced, CA 95344

Reference: Director's formal study dispute resolution determination

Dear Mr. Rabone:

This is my determination on the study disputes filed by the U.S. Department of the Interior, Fish and Wildlife Service (FWS); the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS); and the California State Water Resources Control Board (Water Board) for the Merced River Hydroelectric Project No. 2179. Merced Irrigation District (MID) is using the Integrated Licensing Process (ILP) for relicensing the Merced River Project.

Background

On September 14, 2009, I issued a Study Plan Determination (Determination) for the Merced River Project in response to MID's revised study plan filed August 14, 2009. FWS, on October 2, 2009, and NMFS and the Water Board, on October 5, 2009, filed notices of study dispute pursuant to Section 5.14 of the Federal Energy Regulatory Commission's (Commission) regulations. FWS, NMFS, and the Water Board identified 16 studies they indicated were not adequately accommodated by the Determination. The studies in dispute identified by FWS and NMFS were identical and included the: (1) *Hydrologic Alteration Study*; (2) *Water Balance/Operations Model Study*; (3) *Water Quality Study*; (4) *Water Temperature Model Study*; (5) *Bioaccumulation Study*; (6) *Riparian Habitat and Wetlands Study*; (7) *Reservoir Water Temperature Management Feasibility Study*; (8) *Gravel Sediment Budget and Mobility Study*; (9) *Upper River Fish Populations and Habitat Study*; (10) *Anadromy Salmonid Habitat Study*; (11) *Anadromous Conservation Hatchery Study*; (12) *Anadromous Fish Passage Study*; (13)

Anadromous Fish Passage Facilities Study; (14) *Salmonid Floodplain Rearing Study*; (15) *Chinook Salmon Egg Viability Study*; and (16) *Instream Flow (PHABSIM) Study*.

The Water Board disputed the following studies: (1) *Water Balance/Operations Model Study*; (2) *Water Quality Study*; (3) *Water Temperature Model Study*; (4) *Bioaccumulation Study*; and (5) *Instream Flow (PHABSIM) Study*. Additionally, the Water Board stated they supported NMFS in its dispute of the following studies: (1) *Gravel Sediment Budget and Mobility Study*; (2) *Upper River Fish Populations and Habitat Study*; (3) *Anadromy Salmonid Habitat Study*; (4) *Anadromous Conservation Hatchery Study*; (5) *Anadromous Fish Passage Study*; (6) *Anadromous Fish Passage Facilities Study*; (7) *Salmonid Floodplain Rearing Study*; and (8) *Chinook Salmon Egg Viability Study*. In a letter filed with the Commission on October 30, 2009, MID responded to the study disputes.

In response to the agencies' study dispute notices, Commission staff convened a three-person Dispute Resolution Panel (Panel) on October 16, 2009. Panel members included: Aaron Liberty of the Commission (Panel Chair), Larry Thompson of NMFS¹ (Resource Agency Panelist), and Robert Deibel of the U.S. Forest Service (Independent Third-Party Panelist). On October 28, 2009, the Panel issued a notice informing the disputing agencies that it had been convened and indicating the time and location of a technical conference.

On November 17, 2009, the Panel held a technical conference in Sacramento, CA. The conference was transcribed by a court reporter and included representatives from FWS, NMFS, the Water Board, MID, the Commission, and other interested parties. At the technical conference, representatives from NMFS, FWS, and the Water Board collectively stated that two studies were no longer in dispute. These two studies included the *Hydrologic Alteration Study* and the *Riparian Habitat and Wetlands Study*.² As a result, I have removed these two studies from further consideration in the dispute.

On December 2, 2009, all panel members filed their findings regarding the disputed studies. The Panel Chair and the Independent Third-Party Panelist filed joint findings; the Resource Agency Panelist filed his findings separately. According to the report filed by the Panel Chair and the Independent Third-Party Panelist, not all of the panelists were able to participate fully in preparing the joint findings. The Commission's Final Rule³ envisioned the panel, deliberating together as a whole, and filing a single

¹ Larry Thompson was designated by NMFS, FWS, and the Water Board to represent the federal and state agencies in this dispute.

² Federal Energy Regulatory Commission. *In the Matter of: Merced Irrigation District Dispute Resolution Panel Meeting and Technical Conference*. November, 2009. Ace-Federal Reporters, Inc., 2009. Filed on November 24, 2009. pp-17-30.

³ Final Rule. Hydroelectric Licensing under the Federal Power Act, issued July 23, 2003. 104 FERC ¶ 61,109.

report containing its findings and recommendations. This would assure the panel's collaborative discussion of each panelist's views and would be more likely to result in a consensus report. While the approach taken here does not invalidate the Panel's findings, in the future, I hope panel members will collaboratively produce a single report, which could, of course, contain differing opinions as appropriate.

Study Dispute Determination

Pursuant to Section 5.14(1), my determination on the disputed studies is based on the study criteria set forth in Section 5.9(b) of the Commission regulations, applicable law, Commission policy and practices, and information in the record, including technical expertise of the panel. I summarize my findings below, and include a table of the findings in Appendix A and the basis for the findings in Appendix B.

I am amending two studies ((1) *Water Balance/Operations Model Study* and (2) *Water Temperature Model Study*) to expand the geographic scope. Information presented at the Technical Conference indicated that the approved studies may not provide results that would allow for the reliable correlation of potential project operational scenarios with downstream effects without expanding the geographic scope to Shaffer Bridge.

I am requiring that four studies be considered during the second study season ((5) *Reservoir Water Temperature Management Feasibility Study*; (12) *Salmonid Floodplain Rearing Study*; (13) *Chinook Salmon Egg Viability Study*; and (14) *Instream Flow (PHABSIM) Study downstream of Crocker-Huffman*). These four studies would evaluate a biological or ecological response to water quality and quantity variables associated with project operations. Because of the confounding effects of the downstream Crocker-Huffman diversion dam, an evaluation of the need for these studies should be based upon receipt of results from two approved first-season studies (*Water Balance/Operations Model Study* and the *Water Temperature Model Study*) to identify and isolate direct project effects on water quality and quantity variables.

I am requiring two new studies⁴. The first new study ((11) *Gravel Sediment Budget and Mobility Study*) would evaluate the comparative contribution of the Merced River and Merced Falls Projects to a documented cumulative effect – “channel armoring” downstream of Crocker-Huffman dam. The second new study, ((14) *Instream Flow study downstream of Merced Falls dam*) would evaluate flow-habitat between Merced Falls dam and Crocker-Huffman, due to the potential for the projects to affect flow-related habitat variables in that riverine reach. After consultation with the NMFS, FWS, and the Water Board, and within 45 days of the date of this letter, MID should file, for Commission approval, plans for the implementation of these studies.

⁴ These will, by necessity, need to be cooperative studies between MID's Merced River Project (No. 2179) and Pacific Gas and Electric Company (PG&E), for the downstream Merced Falls Project (No. 2467).

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Finally, I am not adopting or modifying: (3) *Water Quality Study*; (4) *Bioaccumulation Study*; (6) *Upper River Fish Populations and Habitat Study*; (7) *Anadromy Salmonid Habitat Study*; (8) *Anadromous Conservation Hatchery Study*; (9) *Anadromous Fish Passage Study*; and (10) *Anadromous Fish Passage Facilities Study*. These studies did not conform to one or more of the Study Criteria, listed in Section 5.9(b)(1-7), for the reasons discussed in Appendix B.

If you have any questions, please contact Matt Buhyoff at (202) 502-6824.

Sincerely,

Jeff C. Wright
Director
Office of Energy Projects

Enclosures: Appendix A -- List of Modified, Phased, New, and Not Adopted Studies
Appendix B -- Study Dispute Analysis

cc: Mailing List
Public Files

APPENDIX A – MODIFIED, PHASED, NEW, AND NOT ADOPTED STUDIES

STUDY	DETERMINATION			
	<i>Approved Study with Modification</i>	<i>Phased Study</i>	<i>New Study</i>	<i>Study Not Adopted</i>
(1) Water Balance/Operations Model	X			
(2) Water Temperature Model	X			
(3) Water Quality				X
(4) Bioaccumulation				X
(5) Reservoir Water Temperature Management Feasibility		X		
(6) Upper River Fish Populations and Habitat				X
(7) Anadromy Salmonid Habitat				X
(8) Anadromous Conservation Hatchery				X
(9) Anadromous Fish Passage				X
(10) Anadromous Fish Passage Facilities				X
(11) (a) Gravel Sediment Budget and Mobility Study (b) Relative contribution to channel armoring downstream of Crocker-Huffman.			X	X
(12) Salmonid Floodplain Rearing		X		
(13) Chinook Salmon Egg Viability		X		
(14) Instream Flow (PHABSIM): (a) downstream of Crocker-Huffman (b) downstream of Merced Falls dam		X		X

APPENDIX B – STUDY DISPUTE ANALYSIS

Appendix B provides Commission staff's analysis of the disputed studies, with reference to the Panel's and Resource Agency Panelist's findings and recommendations, the study criteria set forth in § 5.9(b), and any applicable law or Commission policies and practices.

The September 2009 Determination discussed the nature of Crocker-Huffman operations as it relates to the relicensing of the Merced River Project. Crocker-Huffman dam (Crocker-Huffman) is located downstream of the Merced River Project dams, and immediately downstream of Pacific Gas and Electric's (PG&E's) Merced Falls Project (FERC No. 2467) dam. Crocker-Huffman is maintained by MID for the implementation of its irrigation program, is not a licensed project facility, and therefore, is not within the Commission's jurisdiction.

The Panel and the Resource Agency Panelist concluded that the Commission erred in its September 2009 Determination when limiting the downstream scope of certain disputed studies to Crocker-Huffman based on the conclusion that expanding the scope of studies downstream of Crocker-Huffman would not inform relicensing participants of direct effects from the Merced River Project.

To clarify, in our Determination, we found that the physical presence of the Merced Falls dam and Crocker-Huffman, in conjunction with MID's irrigation operations, would confound direct project effects downstream of Crocker-Huffman. Hence, as the Panel notes, we did not approve some studies under Study Criterion 5, because a nexus with direct project effects could not be established, and therefore, the results could not be used to inform potential license requirements. We acknowledged the project's potential to contribute to cumulative effects downstream of Crocker-Huffman, both in Scoping Document 2 and in our Determination. Because of the confounding influences of Crocker-Huffman and MID's irrigation operations, we therefore evaluated requested studies based upon their capacity to identify and isolate project effects, thereby demonstrating a capability to inform potential license requirements for the project.

The following contains our analysis of the disputed studies.

(1) *Water Balance/Operations Model Study*

Both the Panel and the Resource Agency Panelist recommended that the Commission expand the scope of the approved study. The Panel and the Resource Agency Panelist concluded that information in the record and information presented at the Technical Conference demonstrated a nexus between project operations and

hydrologic effects downstream of Crocker-Huffman, consistent with Study Criterion 5 (Section 5.9(b)(5)). The Panel concluded that the only way to evaluate baseline conditions, and assign direct, indirect, and cumulative effects is to expand the scope of this study to Shaffer Bridge (RM 32).

We agree with the Panel's and the Resource Agency Panelist's findings. The September 2009 Determination found that the agencies had not adequately addressed a nexus between project operations and effects or how the requested information would inform the development of license requirements (Study Criterion 5). It stated that the existing SJR5Q model would be able to provide information on flows downstream of Crocker-Huffman. We believed that the results from MID's proposed study would have the capacity to identify and isolate direct project effects, even downstream of Crocker-Huffman. However, at the Technical Conference, we learned that the existing model results may not be as valid as originally thought. Discussions at the Technical Conference indicated that the results from existing SJR5Q model may not be suitable to provide a forecast of comparable operations' information for the currently proposed study area and the downstream areas requested by the agencies without model validation. This information will be necessary to provide a depiction of not only the magnitude of potential project effects downstream of Crocker-Huffman, but also the range of viable project operational scenarios to inform potential license requirements, consistent with Study Criterion 5. Given the limited capability of the existing model's scope to provide this information, MID must expand the downstream scope of the *Water Balance/Operations Model Study* to Shaffer Bridge (RM 32).

(2) *Water Temperature Model Study*

The Panel concluded that information in the record and information presented at the technical conference demonstrated that there is a nexus between project operations and hydrologic effects, including temperature, downstream of Crocker-Huffman to Shaffer Bridge, consistent with Study Criterion 5. The Panel recommended that the study be expanded to Shaffer Bridge (RM 32).

Regarding the resource agencies' request that the study scope be extended even further downstream of Shaffer Bridge, the Panel noted that information provided at the technical conference reaffirms the Commission's conclusions in the Determination that the existing SJR5Q model would be adequate to evaluate project-related effects and to evaluate water temperatures under various potential operating scenarios downstream of Shaffer Bridge. Finally, the panel found that existing information would be suitable to meet the requests of the agencies for a thermodynamic model of the project reservoirs and therefore did not recommend any modifications to the approved study plan based upon this request by the agencies.

The Resource Agency Panelist concluded that the Commission should adopt the Agencies' modification to expand the scope of the proposed Water Temperature Model study downstream of Crocker-Huffman. The Resource Agency Panelist indicated that it is not reasonable to halt study downstream of Crocker-Huffman, because the project's instream flow measurement point is several miles downstream of Crocker-Huffman and water temperature is highly influenced by water quantity released from the Merced River Project. Additionally, the Resource Agency Panelist indicated that halting study of water resources downstream of Crocker-Huffman contradicts the Commission's scoping decisions (in SD2) that investigation should be conducted further downstream.

The September 2009 Determination found that the requested addition of five temperature monitoring recorders downstream of Crocker-Huffman, or additional (HEC)-5Q temperature model nodes downstream of Crocker-Huffman, would not provide information that would serve to inform license requirements (Study Criterion 5). Information in the record and presented at the Technical Conference indicated that the addition of model nodes was not necessary, as the existing model displays adequate capability to provide output results approximately every half-mile in the lower Merced River from Crocker-Huffman to its confluence with the San Joachin River. However, discussions at the Technical Conference indicated the need to verify the accuracy of the approved model downstream of Crocker-Huffman. Assuring model validity will ensure the depiction of not only the magnitude of potential project water temperature effects downstream of Crocker-Huffman, but also the range of viable project operation scenarios to inform potential license requirements, consistent with Study Criterion 5.

Therefore, we agree with the Panel's and the Resource Agency Panelist's findings and recommend that the scope of the study be expanded downstream of Crocker-Huffman to Shaffer Bridge (RM 32). The Resource Agency Panelist did not provide justification for expanding the downstream extent of the study beyond Shaffer Bridge. Given the increase of non-project related variables with increasing river distance from the project, I agree that the Panel's recommended scope is sufficient to determine project-related cumulative effects. I also agree with the Panel that existing information indicates that the approved study will satisfy the requests of the agencies for a thermodynamic model of project reservoirs. Therefore, MID must validate the output of the *Water Temperature Model Study* to Shaffer Bridge (RM 32).

(3) *Water Quality Study*

The September 2009 Determination declined the resource agencies' request to add additional water quality study sites downstream of Crocker-Huffman at this time. It found that MID's proposal to study downstream effects of any water quality parameter that exceeded state standards after examination of historic and current data would adequately address any potential cumulative effects of the project downstream of

Crocker-Huffman. The Determination concluded that the resource agencies' requested study did not adequately address nexus between project operation and the resource to be studied, and how the results would inform the development of license requirements, as required by Study Criterion 5.

Both the Panel and the Resource Agency Panelist recommended the Commission expand the scope of the approved study, as requested by the resource agencies. The Panel and the Resource Agency Panelist concluded that information in the record and information presented at the technical conference demonstrated that there is a nexus between project operations and effects on hydrology, and therefore potentially water quality, downstream of Crocker-Huffman, consistent with Study Criterion 5. The Panel concluded that the only way to evaluate baseline conditions and direct, indirect, and cumulative effects is to expand the scope of this study to Shaffer Bridge (RM 32). The Panel also stated that this study will also provide information necessary to evaluate MID's proposal to move the current compliance point to downstream of the project's lower most dam, McSwain dam. The Resource Agency Panelist indicates that the approved study methodology is inadequate, stating: "...[a] review of historical information...will not allow investigation of lower Merced River water quality conditions that could be due, incrementally, to the project." The Panel recommended adopting the disputing agencies requests to expand the scope of this study to Shaffer Bridge (RM 32), but did not recommend the resource agencies' request to expand the scope of this study further downstream of Shaffer Bridge, after finding no basis to do so.

We do not agree with the Panel's and the Resource Agency Panelist's findings that the scope of the study should be expanded downstream of Crocker-Huffman during the first season. However, we believe the study's scope should be expanded if the evaluation of historic and current data indicates a need. The Panel and the Agency Panelist failed to recognize that, as noted by Commission staff in the Determination, the approved *Water Quality Study* already includes the study of dissolved oxygen concentration at a study site downstream of Crocker-Huffman, as well as a phased mechanism for the investigation of any project-related effects on water quality downstream of Crocker-Huffman to Shaffer Bridge if any water quality parameters that exceeds state standards is identified. Therefore, the Panel and the Resource Agency Panelist incorrectly characterize any limit of the downstream geographic scope of the study imposed by the Commission's Determination. We agree with the Resource Agency Panelist that, in isolation, a review of historical information will not allow investigation of lower Merced River water quality conditions that could be due, incrementally, to the project. However, we note that the approved study methodology includes not only a review of historical information, but also the implementation of new water quality surveys at several study sites within project reservoirs, as well as downstream of the Merced Falls Project. Results of the water quality surveys will be available at the Initial Study Report meeting, at which point relicensing participants, including Commission staff, can address the need for further

studies. For these reasons, we maintain that MID's study is sufficient to characterize both direct and indirect Project effects within the geographic scope requested by the resource agencies, and recommended by the Panel and the Resource Agency Panelist.

(4) *Bioaccumulation Study*

The September 2009 Determination found that because MID was not proposing operations or activities typically associated with the release or mobilization of mercury, the resource agencies' requested study did not adequately address nexus between project operation and the resource to be studied, and how the results would inform the development of license requirements, as required by Study Criterion 5.

The Panel agreed with the Determination not to adopt this study. However, the Panel's reasons for not adopting the study differed from the reasons outlined in the Determination. The Panel concluded that although an appropriate nexus had been demonstrated, the disputing agencies did not adequately address how the additional information collected would be useful in developing potential license conditions. The Panel further recommended that in lieu of a study, a public education and information program, regarding the risks associated with mercury bioaccumulation, especially for project reservoirs, would be appropriate.

The Resource Agency Panelist recommended the Commission adopt the *Bioaccumulation Study*. Reiterating the assertions made in the resource agencies' study request that MID's continued operations and maintenance of the project has a potential to affect mercury concentrations in fish dwelling in the project's reservoirs, and that sediment quality within project reservoirs may affect geochemical processes that can promote mercury methylation and enhanced bioaccumulation in resident fish, the Resource Agency Panelist concluded that an appropriate nexus required by Study Criterion 5 had been demonstrated. The Resource Agency Panelist further stated that "it is not reasonable to perform no study whatsoever, given the potential ecological and human health hazards of mercury bioaccumulation." Although the Resource Agency Panelist recommended adopting the Agencies' requested study, he also recommended the adoption of a phased study, where the finding of appreciable bioaccumulation in the Merced River downstream of the project would trigger further evaluation.

We agree with the Panel that the disputing agencies did not adequately address how the results of the requested study would be useful in developing potential license conditions. However, we do not agree with the Resource Agency Panelist's suggestion that the potential hazards of mercury bioaccumulation necessitate a study. The Resource Agency Panelist did not provide an analysis of how the results of the requested study would be useful in developing potential license conditions. Existing information adequately documents the causal mechanisms, vulnerable species, and consequences of

mercury bioaccumulation and will be suitable to inform any potential license conditions, such as a public information program.

Finally, we disagree with the Panel and the Resource Agency Panelist's assessment that the proposed study identifies an appropriate nexus to potential project effects. As stated in the Determination, the baseline for our NEPA analysis of the project is existing conditions, not the original construction of the project reservoirs. MID is not proposing to alter project operations, to increase water fluctuations, or mobilize substrates. Therefore, as proposed, the project is not performing any actions associated with the release or methylation of mercury. For the reasons cited above, we maintain that a study of mercury bioaccumulation is not warranted.

(5) *Reservoir Water Temperature Management Feasibility Study*

The September 2009 Determination found the requested study required development of potential PM&E measures rather than identification of resource effects. It stated that because a project effect had not yet been demonstrated, the assessment was premature, and therefore, the requested study did not address the nexus between project operations and effects (Study Criterion 5).

The Panel concurred with the Determination that NMFS' and FWS' request for this study did not address the nexus between project operations and effects. The Panel further concluded that NMFS and FWS did not provide sufficient justification as to how collecting this information would help inform the agencies' exercise of their mandatory conditioning authorities for fishways under section 18 of the Federal Power Act. However, the Panel recommended that the Commission modify the *Water Temperature Model Study* to reflect a phased approach where the *Reservoir Water Temperature Management Feasibility Study* could be triggered if the results from the *Water Temperature Model Study* indicate agency targeted temperature criteria could not be met. Similarly, the Resource Agency Panelist recommended the Commission approve a phased study approach, but did not provide a specific recommendation for the implementation of a phased study.

We agree with both the Panel and the Resource Agency Panelist that the *Reservoir Water Temperature Management Feasibility Study*, as proposed by the agencies, is premature. We concur with the Panel's conclusion that no project effect has been established, and therefore, studies of water temperature management alternatives are premature. We also agree with the Panel and the Resource Agency Panelist's recommendation to consider a phased approach to the *Reservoir Water Temperature Management Feasibility Study*, based upon results of the *Water Temperature Model Study*. If the results *Water Temperature Model Study* indicate the need for a study to assess reservoir temperature management feasibility, relicensing participants, including

Commission staff, may request such a study, as described by the Commission's regulations in Sections 5.15(d) and 5.15(e).

(6) *Upper River Fish Populations and Habitat Study*

The September 2009 Determination noted that because there was no proposal to introduce fish species into project reservoirs, no proposal for any new project structures upstream of the project's uppermost reservoir Lake McClure, no proposal for any actions that could alter habitat upstream of Lake McClure, and no known anadromous fish populations in the upper Merced River, the requested study had no nexus between project operation and the resource to be studied and, therefore, the proposed study would not inform the development of license requirements (Study Criterion 5).

The Panel concurred with the analysis in the Determination that an appropriate nexus had not been established, due to the absence of anadromous fish in Lake McClure. The Panel recommended the Commission not adopt this study.

The Resource Agency Panelist recommended the Commission approve the agencies requested *Upper River Fish Populations and Habitat Study*. In his evaluation of the nexus between project effects and the requested study, the Resource Agency Panelist cited the resource agencies' study request. Specifically, the Resource Agency Panelist stated: "The Agencies' study request explains that the project prevents upstream passage of fishes in the Merced River, and the project's reservoirs are sources of non-indigenous and non-native fish species that could be adversely affecting indigenous fishes in the upper Merced River (e.g., through competition, genetic effects, etc.). The Agencies explain that if passage for anadromous fishes is provided in the future through the project and upstream, the population condition and suitability of aquatic habitat will inform those decisions (such as indicating the condition of the habitat in the upper Merced to support anadromous fishes)."

In his evaluation of the capability for the requested information to inform the development of license requirements, the Resource Agency Panelist again cited the resource agencies' study request. The Resource Agency Panelist stated: "The Agencies' study request explained it will provide information on project-affected streams to allow for evaluation of the health of fish populations, especially special-status fishes; information on project-affected streams to allow for evaluation of differences between fish populations in project-affected streams and unimpaired streams of similar size, stream flow and elevation; and information on project-affected streams to allow for the evaluation of potential project-related effects on the health and size of fish populations." The Resource Agency Panelist further noted that at the Technical Conference, NMFS brought to the Commission's attention a Draft Recovery Plan that would propose to plant anadromous fish within the project and above the project.

We disagree with the Resource Agency Panelist's analysis that seeks to establish a project nexus to the resource to be studied as required by Study Criterion 5. The Panel noted that anadromous fish do not pass upstream of the Merced Falls dam, which is downstream of the first project dam at McSwain Reservoir, and therefore are not present in Lake McClure or the upper Merced River. As the Panel also noted, the Commission-approved *Reservoir Fish Populations Study* would characterize fish species composition, relative abundance (*e.g.*, catch per unit effort (CPUE)), and size in project reservoirs, including Lake McClure, and there is some redundancy in the resource agencies' request for this information and that requested in *Upper River Fish Populations and Habitat Study*. Because project operations or structures do not affect areas upstream of the uppermost project reservoir, we fail to see how results of the study would allow for the evaluation of project-affected streams, and therefore inform the development of license requirements. Finally, we acknowledge NMFS' *Resource Management Goals and Objectives* for federally-listed anadromous fish filed with the Commission on November 13, 2009, but do not see that it constitutes a Draft Recovery Plan under the Endangered Species Act (ESA), as suggested by the Resource Agency Panelist. Pursuant to section 4(f) of the ESA, a Recovery Plan must include objective, measurable criteria, which when met, will allow delisting of the species, a description of site-specific management actions necessary for recovery, and estimates of the time and cost to carry out the recommended recovery measures. The NMFS document did not include any of these attributes. In addition, pursuant to section 4(f)(4) of ESA, prior to final approval of a new or revised Recovery Plan, NMFS must provide public notice and an opportunity for public review and comment on such a plan. To our knowledge, NMFS has not initiated this effort. Therefore, we do not recommend the *Upper River Fish Populations and Habitat Study* for the reasons discussed here.

(7) *Anadromy Salmonid Habitat Study*

The September 2009 Determination found that existing information would be adequate to perform environmental analyses on salmonid habitat, and therefore, the requested study did not adequately address the need for additional information (Study Criterion 4).⁵ We also found that because the requested study did not address direct effects of project operation, it would not inform the development of license requirements (Study Criterion 5).

The Panel disagreed with Commission staff's conclusion in the Determination that a habitat study of the reach between Crocker-Huffman and Shaffer Bridge is not needed,

⁵ In the Determination, Commission staff stated that existing information would be adequate to perform environmental analyses, but did not explicitly state that the need for additional information is required by Study Criterion 4.

and stated that the agencies provided a sufficient nexus as required by Study Criterion 5. However, the Panel also recommended that the Commission not adopt this study as requested by the disputing agencies. The Panel concluded that the existing habitat assessment conducted by Stillwater Sciences (2008) provides sufficient information regarding aquatic habitat in the downstream areas within the Merced River and that integrating this information with other recommended studies would be sufficient to address baseline conditions and potential project-related effects on anadromous salmonid habitats.

The Resource Agency Panelist recommended the Commission adopt the requested study in its entirety. The Resource Agency Panelist disagreed with our Determination that the requested study did not sufficiently address Study Criterion 5. The Resource Agency Panelist stated “The basis for not adopting the study speaks only to the direct effects of the project, contrary to the regulations at § 5.9(b)(5), and omits consideration of the project’s potential to exert direct, indirect, and/or cumulative effects on anadromous fish populations and habitats downstream of Crocker-Huffman.” The Resource Agency Panelist also disagreed with our Determination that the requested study did not sufficiently describe existing information concerning the subject and the need for additional information, required by Study Criterion 4. The Resource Agency Panelist stated that it is not clear how the existing information described by the Commission in its Determination would adequately assess project effects on floodplain and rearing habitat for juvenile anadromous fishes.

In our Scoping Document 2, Commission staff identified several resources, including federally-listed species, to be cumulatively affected downstream of Crocker-Huffman. Thus, we agree with both the Panel and the Resource Agency Panelist that the nexus between project cumulative effects and the resources has been established. However, direct project effects have not been established. As explained above, results from the *Water Balance/Operations Model Study* and the *Water Temperature Model Study* will serve to identify direct project effects and therefore, inform the necessity and scope of any future studies. We agree with the Panel’s conclusion that the agencies have not adequately described the need for additional information (Study Criterion 4), as existing information, which includes a coarse-scale habitat assessment of the mainstem Merced River, in concert with currently approved studies are sufficient to inform relicensing participants on the potential project-related cumulative effects on anadromous salmonid habitats. For the reasons cited above, we maintain that the study is not warranted.

(8) *Anadromous Conservation Hatchery Study*

The September 2009 Determination found the requested study represented the development of potential PM&E measures rather than effects on a project resource. We

found that because a project effect had not yet been demonstrated, this assessment is premature, and therefore, this requested study did not address the nexus between project operations and effects, or how the study results would inform the development of license requirements (Study Criterion 5).

The Panel and the Resource Agency Panelist recommended the Commission not adopt this study as requested by the disputing agencies. Both the Panel and the Resource Agency Panelist concurred with the analysis in the Determination that the requested study did not adequately address Study Criterion 5 because it addressed future activities rather than current project effects. Finally, the Panel questioned how the disputing agencies could prescribe measures related to an anadromous conservation hatchery under their authorities granted by section 18 of the Federal Power Act or 401 of the Clean Water Act.

While the Resource Agency Panelist recommended the Commission not adopt the requested study as proposed by the disputing agencies, he recommended a phased approach. The Resource Agency Panelist recommended that genetic investigations similar to those identified in proposed *Upper River Fish Populations and Habitat Study*, be performed prior to any conservation hatchery study. The Resource Agency Panelist suggested that if suitable steelhead (*O. mykiss*) stocks are identified, then an assessment of their production in a hatchery could be evaluated, but did not indicate how this information is related to potential project effects.

We agree with the Panel and the Resource Agency Panelist and continue to conclude that the requested study does not adequately address the nexus between project operations and effects, nor effects on a specific resource as required by Study Criterion 5, and therefore, maintain that an anadromous conservation hatchery study is not warranted.

The Resource Agency Panelist's description of a phased study approach did not provide any additional information about how the study would address Study Criterion 5. For this reason, we do not adopt the Resource Agency Panelist's recommendation to include a phased approach for a conservation hatchery study as part of the *Upper River Fish Populations and Habitat Study*.

(9) *Anadromous Fish Passage Study*

The September 2009 Determination found the results from approved studies and results from existing studies could provide information regarding the Project's cumulative effect on certain environmental variables related to the life history requirements of anadromous fish downstream of Crocker-Huffman. It also recognized Crocker-Huffman as an upstream anadromous fish barrier, and found that because the requested study did not address direct effects of project operation, it would not inform the development of license requirements (Study Criterion 5).

The Panel recommended the Commission not adopt this study as requested by the disputing agencies. The Panel concluded that although the status of Crocker-Huffman as an anadromous fish barrier is disputed, anadromous fish cannot currently access the base of the project's McSwain dam. Therefore, the Panel concluded that the disputing agencies did not provide an adequate nexus to project effects, as required by Study Criterion 5. The Panel also concurred with Commission staff's conclusions in the Determination that if anadromous fish are reintroduced to the project area at a later date, the Commission may require additional studies to assess project-related effects on anadromous fish.

The Resource Agency Panelist disagreed with the Panel and recommended the adoption of the study. In his analysis, the Resource Agency Panelist concluded that there is a nexus between project effects and the resource to be studied. The Resource Agency Panelist did not recognize the Merced Falls dam or Crocker-Huffman as upstream anadromous fish barriers, but instead stated that "fish passage across the McSwain and New Exchequer Dams does not necessarily require volitional fish passage facilities at Crocker-Huffman." The Resource Agency Panelist noted that in the request for this study, the resource agencies discussed a "trap and truck" bypass alternative.

We agree with the Panel and continue to conclude that because the project does not currently block anadromous fish passage, the agencies have not demonstrated an adequate nexus to project-related effects as required by Study Criterion 5. Therefore, we maintain that a study of anadromous fish passage is not warranted at this time. As indicated in our Determination, if anadromous fish are reintroduced to the project area at a later date, the Commission may require additional studies to assess project effects on anadromous fish. If NMFS or FWS prescribes a "trap and truck" bypass alternative in its fishway prescription(s), we will evaluate that measure in our NEPA analysis.

(10) *Anadromous Fish Passage Facilities Study*

The September 2009 Determination found the requested study represented the development of potential PM&E measures, rather than effects on a project resource. We found that because a project effect had not yet been demonstrated, this assessment is premature, and therefore, the requested study did not address the nexus between project operations and effects (Study Criterion 5).

The Panel recommended the Commission not adopt this study as requested by the disputing agencies. The Panel agreed that the requested study was premature given the inability of anadromous fish to currently access the base of McSwain dam and therefore, concluded that the resource agencies had not adequately addressed Study Criterion 5. Additionally, the Panel concluded that portions of the requested study would evaluate

potential fish passage facilities, which does not address project effects, as is also required by Study Criterion 5.

The Resource Agency Panelist did not provide a specific recommendation regarding this requested study. The Resource Agency Panelist only reiterated the agency study request; he did not provide an analysis of how the requested study satisfies the study plan criteria. The Resource Agency Panelist suggested the Commission did not discuss this requested study, nor make a determination regarding adoption of this request.

We agree with the Panel's analysis and continue to conclude that the requested study does not satisfy the requirements set forth by Study Criterion 5. We disagree with the Resource Agency Panelist's assessment that Commission staff did not address the requested study in the Determination. As noted by the Panel, "... at the technical conference, Commission staff stated there was a typographical error in the [Determination] and that the second full paragraph on page 13 of the Determination should have referenced the "*Anadromous Fish Passage Facilities Study*," not the, "*Anadromous Fish Passage Study*." For the reasons cited above, we maintain that a study of anadromous fish passage facilities is not warranted.

(11) *Gravel Sediment Budget and Mobility Study*

The September 2009 Determination found the resource agencies did not demonstrate why a study of gravel sediment budget and mobility was needed given the availability of existing information (Study Criterion 4), including bathymetry and sediment transport studies, or how the information would provide information regarding direct project effects, and therefore inform license requirements (Study Criterion 5). We acknowledged the potential cumulative effects of the project upon sediment budget and gravel mobility.

The Panel recommended the Commission not adopt this study as requested by the disputing agencies. The Panel found that neither NMFS nor FWS provided adequate reasoning as to how developing a sediment budget relates to the exercise of their authorities for fishways under section 18 of the Federal Power Act. However, the Panel suggested that the Water Board could use the information from the study to inform license requirements under its broader authority under the Clean Water Act.

The Panel noted that existing information includes a detailed analysis of channel substrate conditions in the areas immediately downstream of Crocker-Huffman. While this information would provide the basis for potential PM&E measures with regard to cumulative effects, it would not identify which facility or facilities are responsible for those effects. Therefore, the Panel recommended that the Commission require a new

study to determine if either the Merced River Project or the Merced Falls Project is the primary contributor to the channel armoring noted in existing studies.

The Resource Agency Panelist recommended the Commission adopt the *Gravel Sediment Budget and Mobility Study*. The Resource Agency Panelist indicated that “it is not reasonable to assume, based on reservoir bathymetry studies, that the upper Merced River delivers supplies [sic] no appreciable coarse sediments downstream to Lake McClure. Instead, it is reasonable to determine, through study, what that supply quantity is. Asserting that no riverine reaches occur in the project area ignores the lower Merced riverine reaches that receive little to no supply of coarse sediments from the upper Merced River, due to interrupted passage at the project’s dams. The assertion also ignores the obvious flow alterations in the lower Merced River caused primarily by the project’s New Exchequer Dam and the large impoundment it forms. These alterations are widely accepted as primary causes of geomorphic alterations to river channels and downstream floodplains.”

Based upon information in the record, as well as the analysis of the Panel and the Resource Agency Panelist, it is clear that sediment supply and mobility in the Merced River downstream of Crocker-Huffman is a function of not only project-related factors, but also the presence of non-project facilities such as PG&E’s Merced Falls dam (FERC No. 2467), Crocker-Huffman, and non-Project irrigation delivery operations. The Determination recognized the project’s potential to contribute to cumulative impacts downstream of Crocker-Huffman, and also recognized existing information that documents channel armoring resulting from cumulative impacts. As the Panel noted, existing information already provides a basis for potential mitigative measures. Furthermore, approved studies, such as the *Water Balance/Operations Model* will provide further information regarding the magnitude of the project’s influence downstream of McSwain dam and scope of viable operation scenarios. For these reasons, we continue to find that the agencies have not adequately described the need for additional information, required by Study Criterion 4.

We agree with the Panel that a new study to determine the relative contributions to downstream effects is most relevant to inform potential license conditions. Such a study will necessitate cooperation between MID and PG&E. Therefore, we will require MID, in coordination with PG&E, to file a study plan, for Commission approval, where the primary objective is to determine the incremental contribution of project effects to channel armoring downstream of Crocker-Huffman. Within 45 days of the date of this letter, and after consultation with NMFS, FWS, and the Water Board, MID should file, for Commission approval, plans for the implementation of these studies. This study plan will also be addressed in the development of the Merced Falls Study Plan.

(12) *Salmonid Floodplain Rearing Study*

The September 2009 Determination found the results from approved studies existing information could provide information regarding the project's cumulative effect on certain environmental variables related to the life history requirements of anadromous fish downstream of Crocker-Huffman. We also recognized Crocker-Huffman as an upstream anadromous fish barrier, and found that because the requested study did not address direct effects of project operation, it would not inform the development of license requirements (Study Criterion 5).

The Panel recommended the Commission not adopt this study as requested by the disputing agencies, but rather integrate it with the requested *Instream Flow (PHABSIM) Study*. The Panel concluded that the requested study was likely too intensive to establish defensible relationships between only three target flow releases and the growth, survival, and health of juvenile salmonids within the Integrated Licensing Process (ILP) timeframe. Given information presented at the Technical Conference, the Panel noted a further technical dilemma wherein the requested study methods dictate collecting juvenile salmon for physiological, histological, and disease analysis. This collection effort would necessitate killing the juvenile salmon. The requested study methods call for the collection of 5,000 juvenile salmon per year, representing a majority of a given year's recruitment to the population in a system with very low numbers of returning adults.

The Resource Agency Panelist recommended the adoption of the study. The Resource Agency Panelist concluded that a nexus exists between the project and requested study. The Resource Agency Panelist stated that the requested study would inform the conditions for immigration and pre-spawning downstream of the project, as well as the project's capability to influence these conditions, and therefore, the results could inform potential project-related enhancement measures and ultimately license conditions.

We agree with the Panel and the Resource Agency Panelist that there is a nexus between project cumulative effects and the resources identified (Study Criterion 5). However, consistent with our Determination, we do not agree with the Resource Agency Panelist's conclusion that the requested study would necessarily inform the development of license requirements, also required by Study Criterion 5. The Resource Agency Panelist suggested that the study would inform the project's capability to influence water quantity. As described above, water quality and quantity variables in the Merced River downstream of Crocker-Huffman are cumulatively affected by project-related factors, as well as the presence of non-project facilities such Merced Falls dam, Crocker-Huffman, and non-project irrigation delivery operations. In addition, current fall pulse flows downstream of Crocker-Huffman are not dictated by the Commission, but rather through a 2002 MOU between MID and the California Department of Fish and Game (CDFG). As noted by the Panel, results of the approved *Water Balance/Operations Model and*

Water Temperature Model studies will provide a depiction of not only the magnitude of potential project effects on water temperature and quantity downstream of Crocker-Huffman, but also the range of viable project operation scenarios for potential license requirements. We find that acquiring this information is essential prior to determining the necessity, utility, or scope of water quantity and quality-dependent biological studies, such as the salmon floodplain rearing study, Chinook salmon egg viability study, or instream flow study, described below.

Furthermore, the potential sizeable juvenile salmon mortality from the requested study methodology, raised during the Technical Conference, and noted above was not addressed by the Resource Agency Panelist. Therefore, we see no reason to change the findings.

For the reasons cited above, we will not require MID, at this time, to conduct a study of salmonid floodplain rearing as requested by the resource agencies. Results from approved studies and results from existing studies could provide information regarding the project's cumulative effect on water quantity, temperature and dissolved oxygen as they relate to the life history requirements of anadromous fish downstream of Crocker-Huffman. However, they may not provide information on the project's capability to influence those variables. If the results of the approved *Water Balance/Operations Model and Water Temperature Model* studies indicate the need for a study to assess the quality of corridor habitat and/or existing spawning and rearing habitat that exists in the lower Merced River, relicensing participants, including Commission staff, may file requests for modification of an approved study or a new study, as described by the Commission's regulations in Sections 5.15(d) and 5.15(e).

(13) *Chinook Salmon Egg Viability Study*

The September 2009 Determination found that the results from approved studies and existing information could provide information regarding the project's cumulative effect on certain environmental variables related to the life history requirements of anadromous fish downstream of Crocker-Huffman. We also recognized Crocker-Huffman as an upstream anadromous fish barrier, and found that because the requested study did not address direct effects of project operation, it would not inform the development of license requirements (Study Criterion 5).

The Panel recommended the Commission not adopt this study as requested by the disputing agencies. The Panel concluded that prior to knowing the magnitude of project effects downstream of Crocker-Huffman, or the capability of the project to mitigate these effects, implementing the *Chinook Salmon Egg Viability Study* at this time was premature, and therefore, the disputing agencies did not meet the criteria required by Study Criterion 5, based on a lack of demonstrated project-related effects. The Panel

further recommended that the Commission consider utilizing a phased approach to address the potential need for this study in the future based upon the results of approved studies.

The Resource Agency Panelist recommended the adoption of the study. The Resource Agency Panelist suggested a nexus for the project by stating: “Resource Agency Panelist [sic] understanding is that a reasonable nexus can be “mapped” between project facilities/operations → flow effects → anadromous “attraction” flows and water temperatures along immigration path → Chinook egg viability → the target species for passage in a potential section 18 fishway prescription and/or a resource protected under a water quality certification.” The Resource Agency Panelist stated that the requested study would inform the conditions for immigration and pre-spawning downstream of the project, as well as the project’s capability to influence these conditions, and therefore the results could inform potential, project-related enhancement measures and ultimately license conditions.

As described above, we agree there is a nexus between project cumulative effects and the resources identified, as required by Study Criterion 5. However, we do not agree with the Resource Agency Panelist’s conclusion that the requested study would inform the development of license requirements, also required by Study Criterion 5. The Resource Agency Panelist suggested that the study would inform the project’s capability to influence variables to be studied. We disagree with this assessment. As previously discussed, we find that acquiring information provided by the approved *Water Balance/Operations Model*, *Water Temperature Model*, and *Water Quality* studies is essential prior to determining the necessity, utility, or scope of water quantity, temperature and dissolved oxygen-dependent biological studies, such as the Chinook salmon egg viability study.

Finally, we agree with the Panel that the disputing agencies have not sufficiently addressed Study Criteria 5, based on a lack of demonstrated project-related effects. For the reasons cited above, at this time, we will not require MID to conduct a study of Chinook salmon egg viability as requested by the agencies. We note that the Panel’s recommendation for a phased study approach can be accommodated by the Commission’s ILP regulations. While results from approved studies and results from existing studies could provide information regarding the Project’s cumulative effect on certain environmental variables related to the life history requirements of anadromous fish downstream of Crocker-Huffman, as previously explained, they may not provide information on the project’s capability to influence those variables. Therefore, if the results of the approved *Water Balance/Operations Model and Water Temperature Model* studies indicate the need for a study to assess Chinook salmon egg viability, relicensing participants may file requests for the modification of an approved study, or requests for a new study, as described by the Commission’s regulations in Sections 5.15(d) and 5.15(e).

(14) Instream Flow (PHABSIM) Study

The September 2009 Determination found that the results from approved studies and existing information could provide information regarding the project's cumulative effect on certain environmental variables related to the life history requirements of anadromous fish downstream of Crocker-Huffman. It also recognized Crocker-Huffman as an upstream anadromous fish barrier, and found that because the requested study did not address direct effects of project operation, it would not inform the development of license requirements (Study Criterion 5).

The Panel recommended the Commission not adopt this study as requested by the disputing agencies, but rather adopt a modified form of the Instream Flow study. The Panel concluded that there is a nexus between project operations and certain project-related effects, including hydrology and therefore potentially fish habitat, downstream of Crocker-Huffman, consistent with Study Criterion 5. The Panel recommended that the Commission modify this study to include two study sites: one upstream and one downstream of Crocker-Huffman and combine this study with the *Salmonid Floodplain Rearing Study* to assess flow-habitat relationships for differing fish species. The Panel noted that a sound approach to conducting such a flow-habitat assessment is to integrate the results with the operational hydrology output from the *Water Balance/Operations Model Study*.

The Resource Agency Panelist recommended the Commission further review existing information before making a decision to adopt or not adopt this study. Also, the Resource Agency Panelist indicated the Commission should review information presented during the Technical Conference that suggested that several studies of the type requested already exist, and were unsuccessful in evaluating fish habitat availability in the lower Merced River, due to the alterations of its channel by pits and levees. The Resource Agency Panelist concluded that there is a nexus between project operations and certain project-related effects, including hydrology and therefore potentially fish habitat, downstream of Crocker-Huffman, consistent with Study Criterion 5.

As described above, we agree there is a nexus between project cumulative effects and the resources identified (Study Criterion 5). However, we do not agree with the Panel's and the Resource Agency Panelist's conclusion that the requested study, performed downstream of Crocker-Huffman would inform the development of license requirements, also required by Study Criterion 5. As previously discussed, we find that acquiring information provided by the approved *Water Balance/Operations Model* and *Water Temperature Model* studies is essential prior to determining the necessity, utility, or scope of water quantity-dependent biological studies, such as the instream flow habitat study.

Furthermore, as indicated by the Resource Agency Panelist, information presented during the Technical Conference questions the efficacy (Study Criterion 4) of performing a flow-habitat study in riverine segments where the channel has been significantly altered by past mining activity, as is commonly seen in the lower Merced River downstream of Crocker-Huffman. For the reasons cited above, we do not require MID to conduct an instream flow habitat study downstream of Crocker-Huffman. We note the Panel's recommendation for a phased study approach can be accommodated by the ILP. While results from the approved *Water Balance/Operations Model*, *Water Temperature Model* and results from existing studies could provide information regarding the Project's cumulative effect on certain environmental variables related to the life history requirements of anadromous fish downstream of Crocker-Huffman, as previously discussed, they may not provide information on the project's capability to influence those variables. Therefore, if the results of the *Water Balance/Operations Model*, *Water Temperature Model* studies indicate the necessity and utility of a study to assess instream flow habitat, relicensing participants, including Commission staff, may request modification of an approved study, or a new study, as described by the Commission's regulations in Sections 5.15(d) and 5.15(e).

We agree with the Panel that an analysis of instream flow habitat downstream of Merced Falls would provide useful information regarding the potential effects of the Merced River and Merced Falls Projects on the river reach between Merced Falls dam and Crocker-Huffman. Such a study will necessitate cooperation between MID and PG&E. Therefore, we will require MID, in coordination with PG&E, to file a flow-habitat study plan for resident fish and Pacific lamprey between Merced Falls dam and Crocker-Huffman. Within 45 days of the date of this letter, and after consultation with NMFS, FWS, and the Water Board, MID should file, for Commission approval, plans for the implementation of these studies. This study plan will also be addressed in the development of the Merced Falls Study Plan

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