

FEDERAL ENERGY REGULATORY COMMISSION  
WASHINGTON, DC 20426  
December 2, 2009

OFFICE OF ENERGY PROJECTS

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

Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First Street, N.E.  
Washington, D.C. 20426

**Re: Findings and Recommendations of the Study Dispute Resolution Panel for the Merced River Hydroelectric Project (P-2179)**

Dear Mrs. Bose:

On October 2, 2009 the U.S. Department of Interior, Fish and Wildlife Service (FWS), and on October 5, 2009 the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS) and California State Water Resources Control Board (Water Board), filed with the Federal Energy Regulatory Commission (Commission) notices of study dispute concerning the Commission staff's September 14, 2009, Study Plan Determination (SPD) on Merced Irrigation District's (MID's) revised study plan.<sup>1</sup> FWS, NMFS, and the Water Board identified a total of 16 different studies in their respective notices of study dispute which the agencies indicated were not adequately accommodated by MID's revised study plan and Commission staff's SPD. 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 the (16) *Instream Flow (PHABSIM) Study*. The Water Board states in its notice of dispute that they are disputing the following studies: (1) *Water Balance/Operations Model Study*; (2) *Water Quality Study*; (3) *Water Temperature Model Study*; (4) *Bioaccumulation Study*; and the (5) *Instream Flow (PHABSIM) Study*. Additionally, the

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<sup>1</sup> MID's revised study plan was filed on August 14, 2009.

Water Board states they support 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 the (8) *Chinook Salmon Egg Viability Study*.<sup>2</sup>

In response to the notices of dispute filed by FWS, NMFS, and the Water Board, the Commission convened a three-person Dispute Resolution Panel (Panel) on October 16, 2009, as directed by 18 C.F.R. § 5.14(d). Panel members consisted of: Aaron Liberty, (Commission staff and Panel chair), Larry Thompson (panelist) of NMFS designated by NMFS, FWS and the Water Board to represent the Federal and State agencies in this dispute, and Robert H. Deibel (independent third party panelist). On October 28, 2009, the Commission issued a notice informing the disputing agencies that a Panel had been convened and that a technical conference was to be held in Sacramento, CA on November 17, 2009, pursuant to 18 C.F.R. § 5.14(j).

In a letter filed with the Commission on October 30, 2009, as directed by 18 C.F.R. § 5.14(i), MID responded to the disputes filed by FWS, NMFS, and the Water Board. On November 17, 2009, the Panel held a technical conference in Sacramento, CA pursuant to 18 C.F.R. § 5.14(j). The conference was recorded by a court reporter and included representatives from FWS, NMFS, 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*. Because these two studies are no longer being formally disputed by NMFS, FWS, and the Water Board, the Panel does not discuss them further.

As required by 18 C.F.R. § 5.14(k) of the regulations, the findings regarding the issues in dispute were to be filed by the Panel no later than 50 days following the notice of study dispute, or by November 23, 2009. As a result of the delay in obtaining the technical conference transcripts, on November 20, 2009, the Director of the Commission's Office of Energy Projects extended this deadline to December 2, 2009. Unfortunately, all of the panelists have not been able to participate fully in preparing this report. In order to meet the Commission's administered deadline in a timely manner, the Panel chair, Aaron Liberty, and the independent third party panelist, Robert H. Deibel, submit this letter and Attachments A and B, as further described below, independent of

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<sup>2</sup> During the November 17, 2009 technical conference (Rose, TR 32: 4-23), and in its November 18, 2009 filing, the Water Board confirmed that they were formally disputing these studies.

Larry Thompson. All references to the “Panel” in the aforementioned attachments represent only the opinions and conclusions of the Panel chair and the independent third party panelist.

After careful review of the record of information for the project, and in consideration of the procedures set forth under 18 C.F.R. § 5.14(k), we present to the Director of the Commission’s Office of Energy Projects, in Attachment A, our assessment and recommendations on the remaining matters in dispute. In Attachment B a table containing the agency disputed studies with Panel recommendations has been provided for reference purposes. Additionally, in Attachment C, Robert H. Deibel (independent third party panelist), independent of Aaron Liberty and Larry Thompson, has attached a submittal discussing the development of protection, mitigation, and enhancement measures as part the Commission’s Integrated Licensing Process (ILP) and the need to collect substantial evidence through the ILP process to support mandatory conditions.

If you have any questions regarding the Panel's recommendations, please contact the Panel chair, Aaron Liberty, at 202-502-6862 or [aaron.liberty@ferc.gov](mailto:aaron.liberty@ferc.gov).

Sincerely,

Aaron Liberty, Panel Chair  
West Branch 2  
Division of Hydropower Licensing

Robert H. Deibel, Independent Third  
Party Panelist

Cc: Enclosure  
Attachment A  
Attachment B  
Attachment C

Mailing List  
Public Record

## Attachment A

### Panel Assessments and Recommendations for the Merced River Project (P-2179) Dispute Resolution

#### INTRODUCTION

##### Scoping Document 2 and the Commission's Study Plan Determination

In section 2.2 of the Commission's Scoping Document 2 (SD2), the Commission states that the presence of Merced Irrigation District's (MID's) Crocker-Huffman diversion dam (RM 52), a non-licensed facility that is not within the Commission's jurisdiction, nullifies the direct effects of the Merced River Project downstream of this facility. However, the Commission recognized that the project may contribute to a cumulative impact downstream of this dam on some resources such as water temperature. Additionally, in section 4.1.1 of SD2, the Commission identified the geographic scope of analysis for federally-listed species as the upper and lower Merced River, including the San Joaquin River between confluences with the Merced and Sacramento Rivers.<sup>3</sup> Lastly, the Commission identified the geographic scope for water quality as the area within the current project boundary downstream to include the segment between Merced Falls Hydroelectric Project (RM 55) (FERC No. 2467) and Crocker-Huffman diversion dam, as well as the approximately 7 mile-long reach of the Merced River between Crocker-Huffman diversion dam and Snelling Road Bridge (RM 45).

In the Commission's Study Plan Determination (SPD), the Commission stated that many study requests from the disputing agencies included the investigation of project-related effects downstream of Crocker-Huffman diversion dam. The Commission also acknowledged that numerous agreements outside of the Commission's jurisdiction dictate flows downstream of Crocker-Huffman diversion dam, resulting in flows that are mutually exclusive due to the operational differences between project facilities and Crocker-Huffman diversion dam. As a result of MID's independent operation of Crocker-Huffman diversion dam, the Commission states direct effects downstream of this dam are confounded and that any studies that attempt to correlate project-related effects downstream of Crocker-Huffman diversion dam would be prone to substantial error, rendering unreliable inferences on project-related effects. However, the Commission also states in the SPD that, "we acknowledge the potential for the project, in combination with Crocker-Huffman operations, to have cumulative effects on several resources downstream of the diversion dam and have noted this where appropriate."

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<sup>3</sup> The Panel notes that the Commission did not define or put geographic boundaries on the upper Merced River.

The Panel notes that the Commission's regulations under 18 C.F.R. § 5.9(b)(5) require that any study request, "explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements." Upon review of SD2, the SPD, and the Commission's regulations under 18 C.F.R. § 5.9(b)(5), the Panel concludes that the Commission erred in its SPD when limiting the downstream scope of certain disputed studies to Crocker-Huffman diversion dam based on the conclusion that expanding the scope of studies downstream of Crocker-Huffman diversion dam would not inform relicensing participants of "direct effects." The Panel concludes 18 C.F.R. § 5.9(b)(5) does not limit a nexus to only direct effects, but rather this criteria also specifies a nexus may be identified between project operations and indirect and/or cumulative effects. Because the Commission has identified the potential for cumulative effects on certain resources downstream of Crocker-Huffman diversion dam in SD2 and in its SPD, we conclude this warrants the expansion of the scope for certain studies based on the requirements of 18 C.F.R. § 5.9(b)(5) to the current most downstream compliance point for instream flows, Shaffer Bridge (RM 32.5). This rationale helps form the basis for the Panel's recommendations pertaining to many studies discussed below (see *Individual Study Plan Discussions*).

### **Baseline and Nexus Phased Study Approach**

The project and environmental setting for this proceeding is extremely complex. New Exchequer dam (RM 62.5) impounds Lake McClure upstream to RM 84.5 and releases from New Exchequer dam flow immediately into Lake McSwain, which is impounded by McSwain dam at RM 56.1. Releases from Lake McSwain dam then flow immediately into Merced Falls Reservoir, which is impounded by Merced Falls dam at RM 55. According to Mr. David Vogel from Natural Resource Scientists, Inc., Crocker-Huffman diversion dam (RM 52) impounds water for approximately 1.5 miles upstream, leaving approximately 1.5 miles downstream of Merced Falls Reservoir until flows reach the Crocker-Huffman diversion dam impoundment (TR 267:22). Thus, there are only 1.5 miles of flowing water under most conditions from Crocker-Huffman diversion dam (RM 52) upstream to the terminus of the Lake McClure impoundment at RM 84.5.<sup>4</sup>

Given the physical complexity of this case, it appears to the Panel that Commission staff reached conclusions in the absence of definitive information or the benefit of information presented during the technical conference to determine if the project has direct, indirect, or cumulative effects. New Exchequer dam impounds over 1 million acre-feet of water and has the most influence over Merced River hydrology of all the facilities on the river. Given the location and storage capacity of Lake McClure and the small capacity of the lower two reservoirs (McSwain and Merced Falls), New

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<sup>4</sup> See figure 6.1-2 of MID's Pre-application Document (PAD) filed on November 5, 2009 for a schematic of project and non-project facilities on the Merced River.

Exchequer project generation releases could have direct, indirect, and cumulative effects on downstream flows in the Merced River and resultant effects to dependent aquatic resources.

MID's Pre-Application Document (PAD) contains representative hydrographs for normal, wet, and dry water years. Figure 6.3.3-3 in the PAD shows that the New Exchequer dam captures at least 50 percent of the spring runoff and increases baseline flows in the late summer and fall by at least 10 times. Figure 1 (Attachment 2) contained in MID's October 30, 2009 filing illustrates that mean daily flow releases downstream of Crocker-Huffman diversion dam are approximately double that for the estimated unimpaired mean daily flow. The July 15, 2009 filing by the Conservation Groups also states that New Exchequer dam can capture 99 percent of the mean annual flow for the Merced River. This initial information is consistent with the concept that dams alter flows by moving water from high runoff periods to low flow periods, resulting in lower flows during normal high runoff periods and higher flows during low flow seasons than that which would naturally occur. The disproportionate influence of Lake McClure compared to facilities downstream and to downstream flows is the basis for this Panel concluding that Lake McClure and project-operations have a direct effect, especially during the non-irrigation season, on flows downstream of the Crocker-Huffman diversion dam.

In addition to the information contained in the PAD and MID's October 30, 2009 filing, the Panel received clarifying information at the technical conference that the maximum hydraulic capacity of the turbines at New Exchequer dam is 2,700 cubic-feet-per second (cfs). McSwain Reservoir immediately downstream of New Exchequer dam has a storage capacity of 9,730 acre-feet. Mr. Nevares, a Pacific Gas and Electric (PG&E) representative at the technical conference with the operations and facilities department of PG&E's Merced Falls Project (P-2467), informed the Panel that the maximum hydraulic capacity at that facility, which is immediately downstream of the Merced River Project, is 750 cfs (TR 137: 7 – 25; 138: 1 – 7). Further, the Merced Falls Project is operated as a run-of-the-river facility and passes inflow from New Exchequer dam through its facility.<sup>5</sup> Merced Falls Reservoir is the smallest reservoir in the series at just 900 acre-feet and project operations are based on inflow from MID's project. Mr. Nevares also mentioned that there is limited storage capacity in the Merced Falls Reservoir and that it would not be uncommon if the 2,700 cfs emanating from MID's Merced River Project would pass through the Merced Falls Project by running 750 cfs through the turbines and then spilling the remaining 1,950 cfs (TR 137: 7 – 25; 138: 1 – 7). Furthermore, PG&E's PAD for the Merced Falls Project notes that there are typically 5 months during the non-irrigation season (November through March) when there is no water diversion at Crocker-Huffman diversion dam. Therefore, the Panel concluded that

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<sup>5</sup> See Pacific Gas and Electric's Merced Falls Project Pre-Application Document, filed on February 23, 2009.

flow releases from New Exchequer dam would directly pass through the Merced Falls Project (RM 55), over Crocker-Huffman diversion dam (RM 52), and downstream to the Merced River. This establishes a direct effect of the project to downstream reaches at least during the non-irrigation season. This further establishes a nexus and direct connection of the Merced River Project to the existing compliance point at Shaffer Bridge (RM 32.5).

The Panel believes that all parties to this proceeding, including Commission staff, would benefit from the implementation of the *Water Balance/Operations Model Study* to provide information on the effects of project operations for different time scales (annual, seasonal, monthly, daily and hourly). As noted below, the Panel believes there are “cornerstone studies” that serve as the foundation from which to determine potential project-related effects, establish baseline conditions and to make determinations on the need for additional studies. The Panel recommends that Commission staff approve a phased study plan approach to be included in the season one study schedule of the Integrated Licensing Process (ILP) that develops triggers on whether to conduct additional studies based on the information collected from implementing the cornerstone studies. The cornerstone studies identified by the Panel include the *Water Balance/Operations Model*, *Water Quality* and the *Water Temperature Model* studies.

If these cornerstone studies affirm a more direct connection than Commission staff originally concluded without the benefit of the additional information presented during the technical conference, then that would trigger additional studies that would help Commission staff explicitly define the baseline condition and assess reasonable effects to resources for alternative operating scenarios. For example, if the *Water Balance/Operations Model Study* verifies project-related effects downstream of Crocker-Huffman diversion dam at least during the 5 month non-irrigation season, then those conditions establish the baseline condition. In order to assess the effects of alternative project operating scenarios, especially the effects of moving the compliance point from Shaffer Bridge to immediately downstream of McSwain Reservoir, Commission staff must formally develop the baseline condition that is based on the operational hydrology and address how those potential changes to hydrology affect fish habitat conditions, physical channel effects, etc. It is difficult for the Panel to determine how to assess the effects of alternative operating scenarios, including moving the compliance point and removing the requirement to release currently licensed flows downstream of Crocker-Huffman diversion dam, to fish habitat or other target resources in the absence of that integrated information. Current conditions in the Merced River for the 6-mile reach between the Merced Falls Reservoir and Crocker-Huffman diversion dam and the 19.5 miles downstream of Crocker-Huffman diversion dam to Shaffer Bridge (RM 32.5), are directly affected by current project operations based on information presented to the Panel at the technical conference and in our review of the record.

Commission staff's initial conclusion that there is no nexus to the 19.5-miles between Crocker-Huffman diversion dam (RM 52) and Shaffer Bridge (RM 32.5) appears to have been reached prematurely and is not consistent with the baseline condition as presented at the technical conference or in the record. There is adequate information in the record to show that the Merced River Hydroelectric Project, via storage and releases at New Exchequer dam, directly affects downstream hydrology and the flow dependent resources more so than Commission staff initially concluded. Therefore, the Panel recommends that the scope of certain Panel supported studies extend downstream from Crocker-Huffman diversion dam (RM 52) to the compliance point at Shaffer Bridge (RM 32.5). At a minimum, the proposal to move the compliance point 34-miles upstream from Shaffer Bridge (RM 32.5) to immediately below McSwain dam (RM 56.1) could directly affect flow conditions and other resources (fish and riparian habitat, water quality, etc.) directly tied to flows. To reach conclusions without the benefit of some of the proposed studies would yield a minimal record from which to conduct assessments of alternative operating scenarios compared to the baseline condition established by currently licensed project operations downstream to Shaffer Bridge.

### **Anadromous Salmonids**

The Panel notes that this proceeding is further complicated by the occurrence of two Commission licensed project facilities, the Merced River Project (P-2179) and PG&E's Merced Falls Project (P-2467). As discussed above, PG&E's Merced Falls Project (P-2467) operates on direct releases from MID's McSwain Powerhouse. Water from the Merced Falls Project then flows downstream to MID's Crocker-Huffman diversion dam. Crocker-Huffman diversion dam is not a licensed project facility but is the controlling structure that releases flows to meet the licensed flow compliance point 19.5 miles downstream (Shaffer Bridge).

Some of Commission staff's rejected studies are based on a disagreement over whether anadromous fish currently pass upstream of Crocker-Huffman diversion dam and make it to the base of Merced Falls dam. Although the Commission is administering these two license proceedings at this time, the Merced Falls Project ILP schedule is slightly behind the schedule for this project. The Panel believes this gets to the nexus argument. Table 7.3.3-1 in MID's PAD shows that juvenile and larval Pacific lamprey, the anadromous form of lamprey, were found above and below Crocker-Huffman diversion dam. In addition to this confirmation that anadromous fish occur above Crocker-Huffman diversion dam, there was information presented at the technical conference by Dr. Martin of the Merced River Conservation Committee that Chinook salmon have been reported by the hatchery manager at the Merced River Hatchery to jump over Crocker-Huffman diversion dam (TR 82: 2-4). However, the Panel notes that Stillwater Sciences' *Merced River Corridor Restoration Plan Baseline Studies* report (2001), states the Merced River Hatchery operator "believed" fall Chinook salmon may



also pass over Crocker-Huffman diversion dam, providing some uncertainty whether Chinook salmon have actually been witnessed passing upstream of this diversion dam. However, the Panel believes this would establish a nexus for some of the anadromous fish studies, at least in the reach between the Merced Falls Project (P-2467) and Crocker-Huffman diversion dam.

The above presents a dilemma for the Panel as some information in the record affirms that anadromous fish make it to the lowermost Commission licensed facility on the Merced River but not to the base of McSwain dam. The Panel's logic in addressing the following studies is: 1) flows measured at Shaffer Bridge originate in Lake McClure and pass through McSwain dam, Merced Falls dam and Crocker-Huffman diversion dam; and 2) information in the record suggests that anadromous fish do occur upstream of Crocker-Huffman diversion dam. The determination of which licensee is responsible for the anadromous fish studies between Merced Falls Project (P-2467) and Crocker-Huffman diversion dam is a matter for the Commission and not this Panel. However, we believe this information in the record contradicts the Commission's SPD conclusion that, "*Crocker-Huffman currently serves as the upstream barrier to anadromous fish migration and fish movement on the Merced River.*" Therefore, the Panel rejects that as the primary reason for not adopting the *Anadromous Fish Passage, Anadromy Salmonid Habitat, Salmonid Rearing, Chinook Egg Viability, and Instream Flow* studies.

Although not a formally proposed study, the Panel believes the only way to determine if anadromous fish occur upstream of Crocker-Huffman diversion dam is to conduct additional fish presence-absence studies for adult and juvenile Pacific lamprey and/or tag anadromous salmonids, especially steelhead trout, to determine if they make it upstream of Crocker-Huffman diversion dam at different flow conditions to cover the range of flows that people suggest steelhead can ascend over the dam.

### **Record of Information**

The Panel struggled with some of the specific points of dispute in the record due to incomplete documents and minimal discussion or reasoning behind Commission staff's SPD and the agencies study dispute filings. It is the opinion of the Panel that neither NMFS, FWS, or the Water Board in their respective study dispute filings explained how their study requests satisfied the criteria set forth under 18 C.F.R. § 5.9(b) as required by 18 C.F.R. § 5.14(b). Rather, the resource agencies referenced earlier filed documents such as their comments, proposed revisions, and revised study request filings. For example, the Water Board in its October 5, 2009 notice of study dispute provided a bulleted list of 8 studies stating it "*supports NOAA Fisheries in its dispute of the Commission's decision not to include the studies listed in their study plan determination.*" The Water Board further provided reasoning that questioned why the Commission did not support the listed studies requested by NMFS in the SPD. The Panel struggled with whether the Water Board was formally disputing those studies based on its

jurisdiction and found it difficult to gain insight into how the agencies believed they had met the disputed criteria by having little to no discussion in their formal notices of study dispute. Although the Panel believes the agencies have failed to conform to these requirements, we do not reject the basis for study disputes on the agencies not having met these criteria since the Panel concludes this it is not within its authority.

Given the lack of specificity or targeted rebuttal to Commission staff's determinations in the SPD, the Panel attempted to reconstruct the intent of the agencies requests based on earlier filings in this proceeding, tied to each agencies mandatory conditioning authority and how the information can be used to develop mandatory conditions pursuant to their respective authorities. Even though some clarity was provided by the disputing agencies at the technical conference, the Panel struggled with the regulatory timeline to complete its duties required by 18 C.F.R. § 5.14(k) given the scope of the 16 studies in dispute.<sup>6</sup> The disputing agencies cited many studies in the record or presented additional information during the technical conference that the Panel could not attain or verify in a timely manner to conduct more in depth analyses to affirm or reject what was presented during the technical conference and meet the regulatory deadline.

The Panel recommendations are based on information in the record and professional judgment. Study specific Panel discussions and the reasoning behind our recommendations are listed below for each study.

## **INDIVIDUAL STUDY PLAN DISCUSSIONS**

### ***Study 2.2-Water Balance/Operations Model Study***

**FERC Determination:** In the SPD, Commission staff concurred with MID's conclusion that output from the *Water Temperature Model Study* may be useful in assessing project-related cumulative effects on stream temperatures and flows downstream of Crocker-Huffman diversion dam. Commission staff determined that there was a lack of nexus between project operations downstream of Crocker-Huffman diversion dam and the resource to be studied, and that the requested information would not inform the development of license requirements as required by study plan criteria 18 C.F.R. §

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<sup>6</sup> The Panel recognizes its duties as required by 18 C.F.R. § 5.14(k) are to deliver a finding "concerning the extent to which each criteria set forth in 18 C.F.R. § 5.9(b) is met or not met, and why, and make recommendations regarding the disputed study based on its findings." However, given the number and complexity of the studies in dispute, and in the interest of time, the Panel made a unanimous decision to only focus on those specific study plan criteria in dispute or those pertinent to support the conclusions made by the Panel. Therefore, the Panel does not address all seven study plan criteria for each of the studies in dispute by the agencies.

5.9(b)(5). Therefore, Commission staff did not adopt the resource agencies requested modifications to the study, as discussed below.

FWS/NMFS Dispute: FWS and NMFS request that the scope of this study be expanded to at least include the current license compliance point, Shaffer Bridge (RM 32), and conform to the geographic scope identified by Commission staff in SD2.

Water Board Dispute: The Water Board reiterated the requests made by FWS and NMFS, as discussed above, stating they disagree with Commission staff's determination regarding nexus and that Commission staff's decision to limit the geographic scope of the model is not consistent with generally accepted scientific practice and the study plan criteria required by 18 C.F.R. § 5.9(b)(6). The Water Board further states this additional information is needed to evaluate the impact of both current and future project operations on the water balance in the lower Merced River and to support or refute MID's proposal to move the flow compliance point to a location downstream of McSwain dam.

Technical Conference Discussion: During the technical conference discussion, Commission staff stated that the existing water temperature model (SJR5Q) would provide sufficient information to assess cumulative effects on predicted stream temperatures and flows downstream to the confluence with the San Joaquin River. The disputing agencies stated that the presence of project reservoirs and dams attenuate high flows in the Merced River downstream of Crocker-Huffman diversion dam and that because of this there was a nexus to project operations. The disputing agencies also stated that cumulative effects must be studied, not just direct effects and that the existing SJR5Q model is insufficient to assess project-related effects because it does not simulate hydropower generation. NMFS and FWS also stated that expanding this study downstream of Crocker-Huffman diversion dam was needed to gain knowledge of the downstream hydrology, which NMFS and FWS stated would be information necessary to assess the need to exercise their mandatory conditioning authority under section 18 of the Federal Power Act. The Water Board also reaffirmed that this information would be needed to make decisions pertaining to their authority under section 401 of the Clean Water Act.

Panel Conclusion: The Panel discusses the reasoning behind their recommendations regarding project-related effects and this study in greater detail above (see *Introduction*). However, in summary, the Panel concludes the Commission erred in its SPD for this study by only referencing potential direct effects under 18 C.F.R. § 5.9(b)(5) as it pertains to conducting this study downstream of Crocker-Huffman diversion dam. The Panel also concludes that information in the record and information presented at the technical conference has demonstrated that there is a nexus between project operations and hydrologic effects downstream of Crocker-Huffman diversion dam, consistent with 18 C.F.R. § 5.9(b)(5). The Panel concludes that the only way to evaluate baseline

conditions, and assign direct, indirect, and cumulative effects is to expand the scope of this study to the current compliance point, at Shaffer Bridge (RM 32).

The Panel further believes this study in addition to the *Water Temperature Model Study* and *Water Quality Study* will serve as the “cornerstone studies,” which will serve as a basis to evaluate the need for additional studies downstream of Crocker-Huffman diversion dam. Lastly, the Panel believes this study will also help to evaluate project-related effects from a hydrologic perspective on other aquatic dependent resources such as fish habitat. Expanding this study to Shaffer Bridge would also provide information necessary to evaluate MID’s proposal to move the current compliance point and possibly change flows downstream of Crocker-Huffman diversion dam that are currently regulated by minimum instream flow requirements at Shaffer Bridge.

In consideration of the record of information before us, the procedures set forth under 18 C.F.R. § 5.9(k), and the criteria of 18 C.F.R. § 5.9(b), we concur with the disputing agencies and recommend that the Commission’s Director of the Office of Energy Projects adopt the disputing agencies requests to expand the scope of this study to the current license compliance point, Shaffer Bridge (RM 32). However, the Panel finds that the agencies request to expand the scope of this study “to at least include the current license compliance point,” is too vague for the Panel to sufficiently evaluate. The Panel has no basis upon which to recommend expanding the scope of this study downstream of Shaffer Bridge and believes our recommendation to expand the study to Shaffer Bridge is consistent with the agencies request and sufficient to determine project-related effects.

### **Study 2.3-Water Quality Study**

FERC Determination: In the SPD, Commission staff stated any study conducted downstream of Crocker-Huffman diversion dam cannot provide information regarding the direct effects of project operation. Commission staff supported MID’s proposal to study any “constituent of interest” in consultation with the stakeholders upon examination of historic and future water quality data and concluded this would adequately address cumulative effects. Commission staff determined there was a lack of nexus between project operations downstream of Crocker-Huffman diversion dam and the resource to be studied, and that the requested information would not inform the development of license requirements as required by study plan criteria 18 C.F.R. § 5.9(b)(5). Therefore, Commission staff did not adopt the resource agencies requested modifications to the study, as discussed below.

FWS/NMFS Dispute: FWS and NMFS request that the scope of this study be expanded to at least include the current license compliance point, Shaffer Bridge (RM 32), and preferably to the San Joaquin River confluence. FWS and NMFS indicate sampling locations would be determined by the Water Board.

Water Board Dispute: The Water Board requests that this study plan include four additional water quality sampling sites between Crocker-Huffman diversion dam and Shaffer Bridge and the collection of dissolved oxygen data at Shaffer Bridge. The Water Board states they disagree with Commission staff's determination and believe there is a nexus given the current license conditions for flows and ramping rates downstream of Crocker-Huffman diversion dam. Lastly, the Water Board states this additional information is needed to analyze MID's proposal to move the flow compliance point to downstream of McSwain dam and that their request is consistent with standard methodology.

Technical Conference Discussion: During the technical conference discussion, Commission staff stated MID's proposal to study any constituent of interest was a reasonable approach and adequate to assess project-related effects on water quality. The disputing agencies stated this approach was inadequate and that water quality information downstream of Crocker-Huffman diversion dam was needed to assess MID's proposal to move the current compliance point, to evaluate project-related effects, and to determine the quality of the migration corridor for anadromous salmonids. NMFS and FWS stated this information would be necessary to assess the need to exercise their mandatory conditioning authority under section 18 of the Federal Power Act. The Water Board also reaffirmed that this information would be needed to make decisions pertaining to their authority under section 401 of the Clean Water Act.

Panel Conclusion: The Panel discusses the reasoning behind their recommendations regarding project-related effects and this study in greater detail above (see *Introduction*). However, in summary, the Panel concludes the Commission erred in its SPD for this study by only referencing potential direct effects under 18 C.F.R. § 5.9(b)(5) as it pertains to conducting this study downstream of Crocker-Huffman diversion dam. The Panel notes the Commission acknowledged the potential for water quality to be cumulatively affected downstream of Crocker-Huffman diversion dam and is uncertain why this study was not expanded downstream to at least the current compliance point, Shaffer Bridge. The Panel also concludes that information in the record and information presented at the technical conference has demonstrated that there is a nexus between project operations and effects on hydrology, and therefore potentially water quality, downstream of Crocker-Huffman diversion dam, consistent with 18 C.F.R. § 5.9(b)(5). The Panel concludes that the only way to evaluate baseline conditions, and direct, indirect, and cumulative effects is to expand the scope of this study to the current compliance point, or Shaffer Bridge (RM 32). The Panel further believes this study in addition to the *Water Balance/Operations Model Study* and *Water Temperature Model Study* will serve as "cornerstone studies," which will serve as a basis to evaluate the need for additional studies downstream of Crocker-Huffman diversion dam. Lastly, the Panel believes this study will also help to evaluate project-related effects from a water quality perspective, and provide information necessary to evaluate MID's proposal to move the current compliance point to downstream of McSwain dam.

In consideration of the record of information before us, the procedures set forth under 18 C.F.R. § 5.9(k), and the criteria of 18 C.F.R. § 5.9(b), we concur with the disputing agencies and recommend that the Commission's Director of the Office of Energy Projects adopt the disputing agencies requests to expand the scope of this study to the current license compliance point, Shaffer Bridge (RM 32). However, the Panel finds that the agencies request to expand the scope of this study "to at least include the current license compliance point," is too vague for the Panel to sufficiently evaluate. The Panel has no basis upon which to recommend expanding the scope of this study downstream of Shaffer Bridge and believes our recommendation to expand the study to Shaffer Bridge is consistent with the agencies request and sufficient to determine project-related effects.

#### ***Study 2.4-Water Temperature Model Study***

FERC Determination: In the SPD, Commission staff stated any study conducted downstream of Crocker-Huffman diversion dam cannot provide information regarding the direct effects of project operations. Commission staff did not adopt requests for five additional temperature monitoring recorders downstream of Crocker-Huffman diversion dam, or the request for additional (HEC)-5Q temperature model nodes downstream of Crocker-Huffman diversion dam, concluding this additional data would not provide information that would serve to inform license requirements as required by study plan criteria 18 C.F.R. § 5.9(b)(5). Lastly, Commission staff stated the existing SJR5Q temperature model, which extends to the San Joaquin River, would be adequate to provide information for the analysis of potential project-related cumulative effects on temperature. In the SPD, Commission staff amended MID's revised study plan to require MID to meet with interested relicensing participants to review and explain the existing SJR5Q model.

FWS/NMFS Dispute: FWS and NMFS request that the scope of this study be expanded from Lake McClure downstream to the San Joaquin River and conform to the geographic scope identified by Commission staff in SD2. FWS and NMFS also request the study include a thermodynamic model of Lake McClure and other reservoirs as determined by the Water Board.

Water Board Dispute: The Water Board reiterated the requests made by FWS and NMFS, as discussed above. The Water Board states they believe Commission staff's decision to limit the geographic scope of the model is not consistent with generally accepted scientific practice and the study plan criteria required by 18 C.F.R. § 5.9(b)(6). Lastly, the Water Board states they will need valid and accurate temperature model output for the lower Merced River upon which to condition its water quality certification.

Technical Conference Discussion: During the technical conference discussion, Commission staff stated that the existing water temperature model (SJR5Q) is suitable to

evaluate project-related effects downstream of Crocker-Huffman diversion dam. The disputing agencies stated the existing SJR5Q model is not robust enough and that they did not have enough comfort with the existing model. Water Board stated the Commission staff's required tutorial on the model was premature. The California Department of Fish and Game stated a primary issue with the existing SJR5Q model is calibration and that expanding the geographic extent and the addition of sites would improve calibration. NMFS and FWS stated this information would be needed to assess the suitability of downstream water temperatures for anadromous fish and that this information was necessary to assess the need to exercise their mandatory conditioning authority under section 18 of the Federal Power Act. The Water Board also reaffirmed that this information would be needed to make decisions pertaining to their authority under section 401 of the Clean Water Act.

Panel Conclusion: The Panel discusses the reasoning behind their recommendations regarding project-related effects and this study in greater detail above (see *Introduction*). However, in summary, the Panel concludes the Commission erred in its SPD for this study by only referencing potential direct effects under 18 C.F.R. § 5.9(b)(5) as it pertains to conducting this study downstream of Crocker-Huffman diversion dam. The Panel also concludes that information in the record and information presented at the technical conference has demonstrated that there is a nexus between project operations and hydrologic effects downstream of Crocker-Huffman diversion dam, consistent with 18 C.F.R. § 5.9(b)(5). The Panel believes results from this study, in addition to the *Water Balance/Operations Model Study* and *Water Quality Study*, will serve as "cornerstone studies" which will serve as a basis to evaluate the need for additional studies downstream of Crocker-Huffman diversion dam. Therefore, the Panel believes this study should be expanded to the current compliance point, Shaffer Bridge (RM 32). However, the Panel notes that information provided at the technical conference reaffirms the Commission's conclusions in the SPD that the existing SJR5Q model is adequate to evaluate project-related effects and to evaluate water temperatures under various potential operating scenarios downstream of Shaffer Bridge.

In consideration of the record of information before us, the procedures set forth under 18 C.F.R. § 5.9(k), and the criteria of 18 C.F.R. § 5.9(b), we concur with the disputing agencies and recommend that the Commission's Director of the Office of Energy Projects adopt the disputing agencies requests to expand the scope of the study downstream to Shaffer Bridge. However, the Panel believes the Commission's requirement in the SPD for MID to hold a tutorial on the SJR5Q model is reasonable and would be adequate to assist the agencies in familiarizing themselves with the existing model for the reach of the Merced River downstream of Shaffer Bridge; therefore, we do not recommend the agencies requests to expand this study downstream of Shaffer Bridge.

Information provided at the technical conference and in the record states the existing SJR5Q model would simulate reservoir thermodynamics and temperature

distribution in Lake McClure, McSwain Reservoir, PG&E's Merced Falls Reservoir and the Crocker-Huffman diversion dam impoundment, as requested by the disputing agencies (Lynch, TR 183: 3-5). The Panel believes this information would be suitable to meet the requests of the agencies for a thermodynamic model and therefore we do not recommend any modifications to the SPD based upon this request by the agencies.

### ***Study 2.5-Bioaccumulation Study***

FERC Determination: In the SPD, Commission staff concluded that the baseline for National Environmental Policy Act (NEPA) analysis is existing conditions and because MID is not proposing to alter project operations to increase reservoir fluctuations, this study is not necessary, as the activation of mercury from sediments into the water column would be unlikely. Commission staff determined that there was a lack of nexus between project operations and the resource to be studied, and that the requested information would not inform the development of license requirements as required by study plan criteria 18 C.F.R. § 5.9(b)(5). Therefore, Commission staff did not adopt the resource agencies requested modifications to the study, as discussed below.

FWS/NMFS Dispute: FWS and NMFS request that the scope of this study be expanded to at least Shaffer Bridge (RM 32), and preferably to the San Joaquin River confluence. FWS and NMFS further request this study also include sediment and fish sampling as determined by the Water Board.

Water Board Dispute: The Water Board reiterated the requests made by FWS and NMFS, as discussed above. The Water Board states this study has a nexus to project operations and that the requested data will be needed for the water quality certification process.

Technical Conference Discussion: During the technical conference discussion, NMFS and FWS stated an assessment of bioaccumulation within the project area was needed to assess potential hazards to anadromous fish downstream of Crocker-Huffman diversion dam and to anadromous fish that may be reintroduced upstream of Crocker-Huffman diversion dam. NMFS and FWS also stated that this information was necessary to assess the need to exercise their mandatory conditioning authority under section 18 of the Federal Power Act. NMFS and FWS representatives also acknowledged that bioaccumulation is worse in piscivorous species such as bass. When the Panel directly asked NMFS and FWS representatives of specific studies about bioaccumulation in juvenile anadromous salmonids that are primarily insectivorous, they did not provide a direct answer. The disputing agencies also spoke to a concern over possible health concerns related to consuming contaminated fish. Mr. Rose of the Water Board stated potential license conditions would be signage and/or public notification of health hazards from consuming contaminated fish (Rose, TR 144:2 – 15).



Panel Conclusion: The Panel believes that the Commission’s reasoning for dismissing this study based on the mobilization of substrates is flawed. In the SPD, the Commission stated, “in some cases large fluctuations in water levels or mobilization of substrate caused by hydroelectric project operations can activate mercury from sediments into the water column, but because MID is not proposing to alter project operations to increase water fluctuations or mobilize substrates, we find the study is not necessary.” The Panel notes other studies have shown that mobilization of riverine sediments is not needed to provide for bioaccumulation of mercury in reservoirs. Further, it is not unreasonable to assume that bioaccumulation of mercury is not pervasive throughout the West Slope Sierra Nevada given the extensive gold mining history. Studies have shown that in West Slope Sierra Nevada reservoirs, bioaccumulation of mercury in tissue of piscivorous fish such as bass can exceed regulatory thresholds (Saiki *et al.* 2009; Saiki *et al.* 2005).

In consideration of the record of information before us, the procedures set forth under 18 C.F.R. § 5.9(k), and the criteria of 18 C.F.R. § 5.9(b), we concur with the SPD and recommend that the Commission’s Director of the Office of Energy Projects does not adopt the disputing agencies request to conduct this study. The Panel concludes that although an appropriate nexus under 18 C.F.R. § 5.9(b)(5) has been demonstrated, the Panel is uncertain as to how this additional information collected would be useful in assessing potential license conditions, which is also required by 18 C.F.R. § 5.9(b)(5). As discussed at the technical conference, protection, mitigation, and enhancement (PM&E) measures that would be developed to address bioaccumulation within the Merced River are limited. As noted during the technical conference, the Water Board stated that likely mitigation would be signage and public education (TR 144:2 – 15). Therefore, the Panel finds that in lieu of a study, a public education and information approach as discussed by the Water Board would be appropriate, especially for project reservoirs. If the results for the *Water Balance/Operations Model* and *Instream Flow (PHABSIM)* studies show that the Merced River downstream of Crocker-Huffman diversion dam would be more suitable for piscivorous fish such as bass due to moving the compliance point, then the Panel recommends the scope of the public education program should extend downstream of Crocker-Huffman diversion dam.

### **Anadromous Salmonid Study Plan Requests**

#### ***Study 2.6-Reservoir Water Temperature Management Feasibility Study***

FERC Determination: In the SPD, Commission staff concluded that this study was premature and represents an assessment of potential protection, mitigation, and enhancement measures (PM&E). Commission staff further concluded this request does not address the nexus between project operations and effects as required by study plan criteria 18 C.F.R. § 5.9(b)(5) and that information gathered from implementing the *Water Quality and Water Temperature Model* studies would provide information on project-related effects on water temperature. Lastly, Commission staff states this information

may be needed in the future and that they would require MID to file a plan for the assessment of reservoir water temperature management if and when results of studies indicate this information is needed.

FWS/NMFS Dispute: FWS and NMFS request that MID conduct an evaluation of engineering alternatives and approximate costs for water temperature management facilities at New Exchequer dam and Lake McClure, McSwain dam and reservoir, Merced Falls dam and reservoir, and Crocker-Huffman diversion dam and reservoir, coordinating with Pacific Gas and Electric (PG&E).

Technical Conference Discussion: During the technical conference discussion, Commission staff reiterated their conclusions in the SPD that this study represents a PM&E measure and does not attempt to address project-related effects, as required by 18 C.F.R. § 5.9(b)(5). MID stated the existing *Water Temperature Model Study*, in combination with the *Water Balance/Operations Model Study*, is capable of simulating reoperation of the project and withdrawal of water from various elevations in Lake McClure, and producing the resulting water temperatures downstream. NMFS and FWS stated that the study results would assist these agencies in implementing section 18 of the Federal Power Act by providing important information needed to make a decision on whether to prescribe fishways for the project. NMFS and FWS also stated that the study would provide information needed to improve water quality and habitat for anadromous fish and that it would inform potential future PM&E's.

Panel Conclusion: The Panel concurs with Commission staff's conclusion in the SPD that NMFS' and FWS' request for this study does not address the nexus between project operations and effects as required by study plan criteria 18 C.F.R. § 5.9(b)(5). The Panel further concludes that NMFS and FWS have not provided a sufficient justification as to how collecting this information would help inform those agencies of whether to exercise their mandatory conditioning authorities for fishways under section 18 of the Federal Power Act at McSwain or New Exchequer dams.

The Panel concludes that conducting this study during the first season of studies under the ILP would be premature, prior to first determining potential project-related effects on water temperature. However, implementing a phased approach to be triggered upon the results of season one study results would be beneficial to allow for an evaluation of potential PM&E measures related to reservoir water temperature management. The Panel believes that utilizing a phased approach is consistent with Commission staff's conclusions in the SPD, and would allow for potential PM&E measures to be analyzed in a timely manner by Commission staff in its NEPA document.

Upon receipt of clarifying information at the technical conference, the Panel agrees that the (HEC)-5 based SJR5Q water temperature model is robust enough to simulate water temperatures in project reservoirs and in downstream reaches (Lynch, TR

183: 3-5; Bergfeld, TR 184: 22-25). With the Panel's recommendation to adjust the scope of the *Water Temperature Model Study* downstream to the compliance point at Shaffer Bridge, the Panel believes that would provide sufficient information to determine if specific water temperatures can be met at least down to the current licensed compliance point. Collecting this data would assist in first determining if project operations can meet resource agency targeted temperature criteria, as this information could be used to narrow the scope of potential solutions and future PM&E measures related to reservoir water temperature management.

In consideration of the record of information before us, the procedures set forth under 18 C.F.R. § 5.9(k), and the criteria of 18 C.F.R. § 5.9(b), we concur with the findings contained in the SPD and recommend that the Commission's Director of the Office of Energy Projects does not adopt the disputing agencies request for this study at this time. However, although the Panel agrees with the Commission that a nexus and need for this study has not been demonstrated at this time, we recommend the Commission utilize a phased approach so the *Reservoir Water Temperature Management Feasibility Study* can be triggered if the results from the *Water Temperature Model Study* indicate agency targeted temperature criteria could be met. However, we note that NMFS and FWS should provide specific water temperature criteria critical to facilitating fish movement upstream and downstream during the seasons adult anadromous fish and smolts migrate and that the Water Board should supply basin specific temperature criteria for inclusion in the *Water Temperature Model Study* before proceeding with a study to design elevation specific water temperature structures.

### **Study G1-Gravel Sediment Budget and Mobility Study**

FERC Determination: In the SPD, Commission staff concluded that because the project contains no riverine segments, studies of riverine geomorphic processes do not have a nexus to project effects as required by study plan criteria 18 C.F.R. § 5.9(b)(5). Commission staff further states that the existing bathymetry surveys do not indicate project reservoirs are experiencing appreciable sediment storage, indicating sediment loading and capture is not a significant issue. Commission staff concluded an argument as to why the additional information is needed has not been presented as required by study plan criteria 18 C.F.R. § 5.9(b)(4) and that any study conducted downstream of Crocker-Huffman diversion dam cannot provide information on the direct effects of project operations as required by 18 C.F.R. § 5.9(b)(5). Additionally, Commission staff concluded there is adequate existing information in the Pre-Application Document (PAD) to assess project-related cumulative effects regarding this issue.

FWS/NMFS Dispute: FWS and NMFS request that an assessment of the Merced River's sediment capture in reservoirs, transport, recruitment, and quality related to anadromous salmonid habitat be conducted. In its July 16, 2009 filing, the FWS stated that it endorses and supports a study to quantify the sediment and gravel transport, recruitment, and

quality for anadromous salmonids both upstream, within, and downstream of the Merced River (P-2179) and Merced Falls (P-2467) projects. NMFS, in its July 16, 2009 filing, expanded the scope of the study to include geomorphic processes to optimize existing spawning and incubation gravels and floodplain habitats.

Water Board Dispute: In its October 5, 2009 filing, the Water Board states they support the disputes filed by NMFS for this study and that the information collected through implementing this study would establish whether or under what conditions the beneficial uses assigned to the Merced River are adequately protected. The Water Board further states this information will aid in the development of the water quality certification.

Technical Conference Discussion: During the technical conference discussion, Commission staff reiterated their conclusions contained in the SPD. The disputing agencies stated the Merced River downstream of project facilities is armored due to project reservoirs capturing sediment and periodic high flows transporting the sediment downstream without replacement from upstream sources. The disputing agencies also stated that Lake McClure is the most upstream reservoir and therefore, is a project facility that impedes gravel transport to downstream reaches. NMFS and FWS also stated a healthy migration corridor for anadromous fish restoration is needed in the Merced River and that this information is necessary to assess the need to exercise their mandatory conditioning authority under section 18 of the Federal Power Act. The Water Board commented that habitat is tied to promulgated beneficial uses and that water quality and quantity are within the scope of their authority under section 401 of the Clean Water Act. During the technical conference, the parties agreed that it is reasonable to conclude that the project facilities, namely Lake McClure, the most upstream project facility, stops the movement of substrate downstream to other project reservoirs, Merced Falls Reservoir, and to the Merced River downstream of Merced Falls dam.

The lack of specificity (i.e. NMFS' expanded scope to include floodplain habitats) of the agencies in the formal notices of study dispute made it difficult for the Panel to narrow down the specific issue in dispute. For this study, the Panel focused on the affect of the project on channel substrate issues.

Panel Conclusion: NMFS and FWS state in their July 16, 2009 filings that the goal of this study is to determine how project operations, maintenance, and construction affect Merced River habitat, specifically river channel and floodplains with respect to spawning and rearing habitat, necessary for the maintenance and enhancement of anadromous salmonids. However, as previously discussed (see *Introduction*), the Panel recognizes there is uncertainty over whether or not anadromous salmonids make it upstream of Crocker-Huffman diversion dam. Pacific lamprey have been observed upstream of Crocker-Huffman dam and during the technical meeting, Chinook salmon were stated to have been observed passing over Crocker-Huffman diversion dam (Dr. Martin, TR 82: 2-4). However, the Panel notes that even if anadromous fish pass over Crocker-Huffman

diversion dam, there are no operating fish passage facilities at the Commission's licensed Merced Falls Project (P-2467), which is downstream of McSwain dam.

FWS in its July 16, 2009 filing stated that it endorsed and supported the 10 anadromous studies and listed them, including the *Gravel Sediment Budget and Mobility Study*. Furthermore, during the technical conference, neither NMFS or 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. Therefore, the Panel concludes that the NMFS and the FWS have failed to establish an appropriate nexus as required by 18 C.F.R. § 5.9(b)(5). However, the Panel concludes that the Water Board has established a nexus based on input at the technical conference with its broader authority under the Clean Water Act.

However, in consideration of the record of information before us, the procedures set forth under 18 C.F.R. § 5.9(k), and the criteria of 18 C.F.R. § 5.9(b), we concur with the SPD and recommend that the Commission's Director of the Office of Energy Projects does not adopt the study as proposed but consider the following modification.

Whether anadromous salmonids pass over Crocker-Huffman diversion dam or not, assessing the effects of project operations on instream channel conditions should be included in at least the baseline assessment. Therefore, the Panel recommends that the Commission consider the following modification by requiring either MID, PG&E, or both, to conduct a less intensive study to validate the effects of the dams to the flowing section of the Merced River between Merced Falls and Crocker-Huffman diversion dam and downstream of Crocker-Huffman to Shaffer Bridge. The following study would be needed to determine which facility is the major contributor to channel armoring between Merced Falls dam and Crocker-Huffman diversion dam. The study should build upon the information presented in the *Merced River Corridor Restoration Plan Baseline Studies: Volume II: Geomorphic and Riparian Vegetation Investigations Report* prepared by Stillwater Sciences (2001-incorporated by reference in MID's PAD). This report includes a detailed analysis of channel substrate conditions in the areas immediately downstream of Crocker-Huffman diversion dam. A suitable reference section, if one can be selected, should be included to determine the amounts of desired spawning gravel that would be expected in the absence of the reservoirs along with adding a study site between Merced Falls and Crocker-Huffman diversion dam. The assessment would include comparing the results for the different flowing river sections between Merced Falls dam and Crocker-Huffman diversion dam and downstream of Crocker-Huffman diversion dam down to Shaffer Bridge. If the armoring is more pronounced downstream of Crocker-Huffman diversion dam, then that would show Crocker-Huffman diversion dam is having a cumulative negative effect. If the armoring is not that much different below Crocker-Huffman diversion dam than upstream of Crocker-Huffman but different than expected or different from conditions in upstream control reaches, then that would point to the project facilities as the prime causative agent for the changes.

The parties that participated in the technical conference all concurred that channel armoring is most likely occurring and there are other factors affecting the amount of suitable spawning gravel in the Merced River upstream and downstream of Crocker-Huffman diversion dam. Since gravel supplementation is an accepted approach to mitigating for channel armoring due to dams, the Panel believes the money and effort could be better expended in a joint effort to develop a comprehensive gravel supplementation plan.

### ***Study 3.1a-Upper River Fish Populations and Habitat Study***

FERC Determination: In the SPD, Commission staff stated there are no current proposals to introduce fish species into project reservoirs, and no project structures upstream of Lake McClure that would pose an entrainment risk. Commission staff concluded MID does not propose any actions to alter habitat parameters upstream of Lake McClure and that the proposed *Reservoir Fish Populations Study* would provide information on species assemblage and fish populations. Commission staff determined that there was a lack of nexus between project operations and the resource to be studied, and that the requested information would not inform the development of license requirements as required by study plan criteria 18 C.F.R. § 5.9(b)(5). Therefore, Commission staff did not adopt the resource agencies requested modifications to the study, as discussed below.

FWS/NMFS Dispute: FWS and NMFS request that MID conduct an assessment of anadromous fish populations and habitat upstream of the project in the upper Merced River. The intent of the study is to characterize fish species composition, relative abundance, and size of all native and non-native fishes.

Water Board Dispute: The Water Board states they support the disputes filed by NMFS for this study and that the information collected through implementing this study would establish whether or under what conditions the beneficial uses assigned to the Merced River are adequately protected. The Water Board further states this information will aid in the development of the water quality certification.

Technical Conference Discussion: During the technical conference, Commission staff reiterated their conclusions contained in the SPD. NMFS and FWS stated that the study results would assist these agencies in implementing section 18 of the Federal Power Act by providing important information needed to make a decision on whether to prescribe fishways for the project. NMFS and FWS also stated an investigation of the habitat in the upper Merced River was essential information needed prior to any anadromous fish restoration efforts. The Water Board also reaffirmed that this information would be needed to make decisions pertaining to their authority under section 401 of the Clean Water Act. Additionally, FWS stated they were unaware of any similar relicensings

where such a study had not been done and stated the study was needed because current habitat conditions in the upper Merced River are unknown.

Panel Conclusion: It is well understood by the Panel that information to assess the potential success of reintroducing anadromous fish is very important prior to NMFS or FWS exercising their authority to prescribe fish passage under section 18 of the Federal Power Act. If the Commission considers assessing the effects of MID's project and PG&E's Merced Falls Project in a single NEPA analysis, then this information would be most helpful. The Panel also notes that information has been presented at the technical conference and in the record that the Merced River upstream of Lake McClure is a Federally Designated Wild and Scenic River and the headwaters occur in Yosemite National Park (Robbins, TR 219: 13-17). NMFS staff presented information from Lindley *et al.* (2006) that estimated there are 193 miles of salmonid habitat (primarily steelhead) upstream of Lake McClure including an estimated 39 miles of historic spring-run Chinook salmon habitat (Wantuck, TR 163: 12-24). The Panel concludes that in the absence of the additional habitat information requested to be developed by this study, the fact that the upper Merced River is a National Wild and Scenic River and originates in a National Park, could serve as the basis for a section 18 fish passage prescription by NMFS or FWS.

The Panel notes that anadromous fish do not pass upstream of the Merced Falls dam, which is downstream of the first project dam at McSwain Reservoir, and are therefore not present within Lake McClure or the upper Merced River. Additionally, the Panel has also not received or observed any evidence in the record of any proposals to reintroduce anadromous fish within Lake McClure or into the upper Merced River. Additionally, the Panel notes that 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 that there appears to be some redundancy in the agencies request for this information via the *Upper River Fish Populations and Habitat Study*. Therefore, the Panel concludes an appropriate nexus has not been established as required by 18 C.F.R. § 5.9(b)(5) due to the absence of anadromous fish within Lake McClure.

In consideration of the record of information before us, the procedures set forth under 18 C.F.R. § 5.9(k), and the criteria of 18 C.F.R. § 5.9(b), we concur with the SPD and recommend that the Commission's Director of the Office of Energy Projects does not adopt the disputing agencies requests to adopt this study.

### **Study 3.1b-Anadromy Salmonid Habitat Study**

FERC Determination: In the SPD, Commission staff states Crocker-Huffman diversion dam currently serves as the upstream barrier to anadromous fish migration and fish movement on the Merced River. Commission staff concluded that the requested

information would not inform the development of license requirements as required by study plan criteria 18 C.F.R. § 5.9(b)(5) and that both existing information and information collected as part of the proposed *Water Balance/Operations Model*, *Water Quality*, and *Water Temperature Model* studies would provide adequate information regarding potential project-related cumulative effects on anadromous fish downstream of Crocker-Huffman diversion dam. Commission staff also stated that if anadromous fish are reintroduced to the project area at a later date, the Commission may require additional studies to assess project effects.

FWS/NMFS Dispute: FWS and NMFS request that MID conduct an assessment of anadromous fish populations and habitat within and downstream of the project in the lower Merced River.

Water Board Dispute: The Water Board states they support the disputes filed by NMFS for this study and that the information collected through implementing this study would establish whether or under what conditions the beneficial uses assigned to the Merced River are adequately protected. The Water Board further states this information will aid in the development of the water quality certification.

Technical Conference Discussion: During the technical conference, Commission staff stated that some of the “anadromous fish studies” may best be addressed in a phased approach and that the Commission’s concern involves separating irrigation versus project-related effects downstream of Crocker-Huffman diversion dam. NMFS and FWS stated that the study results would assist these agencies in implementing section 18 of the Federal Power Act by providing important information needed to make a decision on whether to prescribe fishways for the project. The Water Board also reaffirmed that this information would be needed to make decisions pertaining to their authority under section 401 of the Clean Water Act.

Panel Conclusion: The Panel discusses the reasoning behind their assessment regarding project-related effects downstream of Crocker-Huffman diversion dam in greater detail above (see *Introduction*). The Panel also notes that in SD2 Commission staff identified the geographic scope of analysis for federally-listed species as the upper and lower Merced River, including the San Joaquin River between confluences with the Merced and Sacramento Rivers.

The Panel disagrees with Commission staff’s conclusion in the SPD that a habitat study of the reach between Crocker-Huffman diversion dam and Shaffer Bridge is not needed, and believes the disputing agencies have provided a sufficient nexus as required by 18 C.F.R. § 5.9(b)(5) for this reach, and for the reach upstream of Crocker-Huffman diversion dam given the likely project-related effects on hydrology and the potential presence of anadromous salmonids upstream of Crocker-Huffman diversion dam (see *Introduction*). Additionally, the Panel believes the disputing agencies have provided a



sufficient rationale as to how collecting this information would help to inform mandatory conditioning agencies of whether to exercise their mandatory conditioning authorities under section 18 of the Federal Power Act or section 401 of the Clean Water Act.

The Panel concludes that a habitat survey would supplement information to assess potential alternatives to the baseline condition which includes the reach between Crocker-Huffman diversion dam and the current compliance point, Shaffer Bridge. However, the Panel believes a habitat study from the base of Merced Falls dam downstream to Shaffer Bridge could be integrated with other studies supported by the Panel. The results of this habitat study could be incorporated into the hydrology output from the *Water Balance/Operations Model Study* and an instream habitat assessment to define current habitat conditions under baseline conditions and habitat conditions under alternative operating scenarios.

However, the Panel notes that Stillwater Sciences (2008) has already conducted a coarse-scale aquatic habitat assessment for 123 miles of the mainstem Merced River. The Panel believes this habitat assessment is suitable to define baseline aquatic habitat conditions and can be used to link habitat outcomes to alternative operating scenarios. Therefore, the Panel recommends that Commission staff review the *Merced River Alliance Final Report, Volume II: Biological Monitoring and Assessment*, prepared by Stillwater Sciences (2008), which is incorporated by reference in MID's PAD and other filings, to determine if this study is adequate to meet the information needed to conduct an assessment of baseline and alternative operating scenarios.

In consideration of the record of information before us, the procedures set forth under 18 C.F.R. § 5.9(k), and the criteria of 18 C.F.R. § 5.9(b), we concur with the SPD and recommend that the Commission's Director of the Office of Energy Projects does not adopt the disputing agencies requests to adopt this study. As described above, the Panel believes the existing habitat assessment conducted by Stillwater Sciences (2008) provides sufficient information regarding aquatic habitat within the Merced River and that integrating this information with other Panel recommended studies would be sufficient to address baseline conditions and potential project-related effects on anadromous salmonid habitats. However, in the event Commission staff deems the information contained in Stillwater Sciences (2008) report inadequate, the Panel recommends conducting this study from the Merced Falls dam downstream to the current compliance point, Shaffer Bridge.

### **Study 3.3-Anadromous Conservation Hatchery Study**

FERC Determination: In the SPD, Commission staff concluded that this study was premature and represents an assessment of PM&E measures. Commission staff further concluded this request does not address the nexus between project operations and effects as required by study plan criteria 18 C.F.R. § 5.9(b)(5) and that information gathered in

the *Reservoir Fish Populations Study* would provide information regarding the species assemblage and populations in the project area.

FWS/NMFS Dispute: FWS and NMFS request MID conduct an assessment of local fish hatcheries as an anadromous conservation hatchery.

Water Board Dispute: The Water Board states they support the disputes filed by NMFS for this study and that the information collected through implementing this study would establish whether or under what conditions the beneficial uses assigned to the Merced River are adequately protected. The Water Board further states this information will aid in the development of the water quality certification.

Technical Conference Discussion: During the technical conference discussion, NMFS and FWS stated a conservation hatchery could potentially be used as a collection point for either genetic maintenance/propagation or as a waypoint in an upstream, non-volitional passage plan. NMFS and FWS stated that the study results would assist these agencies in implementing section 18 of the Federal Power Act by providing important information needed to make a decision on whether to prescribe fishways for the project. The Water Board also reaffirmed that this information would be needed to make decisions pertaining to their authority under section 401 of the Clean Water Act.

Panel Conclusion: Study plan criteria 18 C.F.R. § 5.9(b)(5) requires an explanation of any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied. The Panel concludes that FWS, NMFS and the Water Board have not adequately addressed this criterion as the requested study would evaluate existing and potentially new hatchery facilities as it pertains to steelhead reintroduction in the project area, and does not address effects on a particular resource, as is required by 18 C.F.R. § 5.9(b)(5). Additionally, the Panel is uncertain as to how the disputing agencies can prescribe measures related to an anadromous conservation hatchery under their authorities granted by sections 18 of the Federal Power Act or 401 of the Clean Water Act.

In consideration of the record of information before us, the procedures set forth under 18 C.F.R. § 5.9(k), and the criteria of 18 C.F.R. § 5.9(b), we concur with the SPD and recommend that the Commission's Director of the Office of Energy Projects does not adopt the disputing agencies requests to adopt this study.

### ***Study 3.4-Anadromous Fish Passage Study***

FERC Determination: In the SPD, Commission staff states Crocker-Huffman diversion dam currently serves as the upstream barrier to anadromous fish migration and fish movement on the Merced River. Commission staff concluded the requested information would not inform the Commission or relicensing participants of the direct effects of the

Project's operations downstream of Crocker-Huffman diversion dam and that both existing information and information collected as part of the proposed *Water Balance/Operations Model*, *Water Quality*, and *Water Temperature Model* studies would provide adequate information regarding potential project-related cumulative effects on anadromous fish downstream of Crocker-Huffman diversion dam. Commission staff also stated that if anadromous fish are reintroduced to the project area at a later date, the Commission may require additional studies to assess project effects.

FWS/NMFS Dispute: FWS and NMFS request that MID conduct an assessment/evaluation of potential anadromous fish passage scenarios, including the use of SHIRAZ, DHSVM, and RIPPPLE habitat and fish population models.

Water Board Dispute: The Water Board states they support the disputes filed by NMFS for this study and that the information collected through implementing this study would establish whether or under what conditions the beneficial uses assigned to the Merced River are adequately protected. The Water Board further states this information will aid in the development of the water quality certification.

Technical Conference Discussion: During the technical conference discussion, NMFS and FWS stated this study was needed to assess a range of alternatives for evaluating potential fish passage options and for developing plans to restore access to historic habitats. NMFS also stated that they would be filing a comprehensive plan with the Commission calling for the reestablishment of anadromous fish in the project area. NMFS and FWS stated that the study results would assist these agencies in implementing section 18 of the Federal Power Act by providing important information needed to make a decision on whether to prescribe fishways for the project. The Water Board also reaffirmed that this information would be needed to make decisions pertaining to their authority under section 401 of the Clean Water Act.

Panel Conclusion: The Panel has verified statements made during the technical conference regarding the ability of some species of anadromous fish to pass over Crocker-Huffman diversion dam during certain flow conditions. Stillwater Sciences (2008), *Merced River Alliance Final Report, Volume II: Biological Monitoring and Assessment*, confirms Pacific lamprey have been collected upstream of Crocker-Huffman diversion dam, indicating volitional upstream passage does occur. And in Stillwater Sciences, *Merced River Corridor Restoration Plan Baseline Studies* (2001), statements were made confirming that the Merced River Hatchery operator believed fall Chinook salmon may also pass over Crocker-Huffman diversion dam, although it is unclear in the report whether Chinook salmon have actually been witnessed passing upstream of this diversion dam. Furthermore, statements made at the technical conference suggested Chinook salmon did pass over Crocker-Huffman diversion dam (Dr. Martin, TR 82: 2-4). However, the Panel notes that this issue of fish passage in the Merced River is further complicated by the presence of the Merced Falls Project (P-2467), which prevents further

upstream passage and blocks all anadromous fish access to the base of the Merced River Project's McSwain dam.

Because anadromous fish can not currently access the base of McSwain dam, the Panel believes the disputing agencies have not provided an adequate nexus to project-related effects, as required by 18 C.F.R. § 5.9(b)(5). The Panel concurs with Commission staff's conclusions in the SPD that if anadromous fish are reintroduced to the project area at a later date, the Commission should require additional studies to assess project-related effects on anadromous fish. The Panel notes that NMFS, FWS and the Water Board could reserve their authority to condition this project at a later date consistent with Commission staff's assessment in the SPD and that this study could be implemented at that time to address critical information needs.

In consideration of the record of information before us, the procedures set forth under 18 C.F.R. § 5.9(k), and the criteria of 18 C.F.R. § 5.9(b), we concur with the SPD and recommend that the Commission's Director of the Office of Energy Projects does not adopt the disputing agencies requests to adopt this study. However, as discussed above, the Panel recognizes that there is conflicting information regarding whether anadromous fish pass upstream of Crocker-Huffman diversion dam and make it to the base of Merced Falls dam. The Panel is reiterating its recommendation (see *Introduction*) to conduct a study that conclusively determines if anadromous fish can pass over Crocker-Huffman diversion dam. If affirmed, then additional studies proposed by the agencies may need to be conducted to assess the effects of the project on anadromous fish and their habitat.

### ***Study 3.5-Anadromous Fish Passage Facilities Study***

FERC Determination: Commission staff did not address this study in its SPD although at the technical conference, Commission staff stated there was a typographical error in the SPD and that the second full paragraph on page 13 of the SPD should have referenced the "*Anadromous Fish Passage Facilities Study*," not the, "*Anadromous Fish Passage Study*." Based on this correction, in the SPD Commission staff concluded that this study was premature and represents an assessment of PM&E measures. Commission staff further concluded this request does not address the nexus between project operations and effects as required by study plan criteria 18 C.F.R. § 5.9(b)(5) and that information gathered in the *Reservoir Fish Populations Study* would provide information regarding species assemblage and populations in the project area.

FWS/NMFS Dispute: FWS and NMFS request MID conduct an evaluation of engineering alternatives and approximate costs for upstream and downstream fish passage facilities at New Exchequer dam and Lake McClure, McSwain dam and reservoir, Merced Falls dam and reservoir, and Crocker-Huffman diversion dam and reservoir (coordinating w/PG&E).

Water Board Dispute: The Water Board states they support the disputes filed by NMFS for this study and that the information collected through implementing this study would establish whether or under what conditions the beneficial uses assigned to the Merced River are adequately protected. The Water Board further states this information will aid in the development of the water quality certification.

Technical Conference Discussion: During the technical conference, Commission staff reiterated conclusions made in the SPD. NMFS and FWS stated this study would be needed to address the engineering concepts related to potential fish passage at the project and addressed the amount of historic anadromous fish habitat blocked by the project. NMFS stated that they would be filing a comprehensive plan with the Commission calling for the reestablishment of anadromous fish in the project area. NMFS and FWS also stated that the study results would assist these agencies in implementing section 18 of the Federal Power Act by providing important information needed to make a decision on whether to prescribe fishways for the project. The Water Board also reaffirmed that this information would be needed to make decisions pertaining to their authority under section 401 of the Clean Water Act.

Panel Conclusion: Study plan criteria 18 C.F.R. § 5.9(b)(5) requires an explanation of any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied. The Panel concludes that FWS, NMFS and the Water Board have not adequately addressed this criterion as the requested study is premature given the inability of anadromous fish to currently access the base of McSwain dam.

In addition, the Panel believes portions of this requested study would evaluate potential fish passage facilities, which does not address effects on a particular resource, as is also required by 18 C.F.R. § 5.9(b)(5). However, if and when anadromous fish do attain access to the base of McSwain dam, the Panel agrees with Commission staff's conclusions in the SPD that the need for this study should be reevaluated. The Panel notes that NMFS, FWS and the Water Board could reserve their authority to condition this project at a later date consistent with Commission staff's assessment in the SPD and that this study could be implemented at that time to address critical information needs.

In consideration of the record of information before us, the procedures set forth under 18 C.F.R. § 5.9(k), and the criteria of 18 C.F.R. § 5.9(b), we concur with the SPD and recommend that the Commission's Director of the Office of Energy Projects does not adopt the disputing agencies requests to adopt this study.

### ***Study 3.6-Salmonid Floodplain Rearing Study***

FERC Determination: In the SPD, Commission staff states Crocker-Huffman diversion dam currently serves as the upstream barrier to anadromous fish migration and fish movement on the Merced River. Commission staff concluded the requested information

would not inform the Commission or relicensing participants of the direct effects of the Project's operations downstream of Crocker-Huffman diversion dam and that both existing information and information collected as part of the proposed *Water Balance/Operations Model*, *Water Quality*, and *Water Temperature Model* studies would provide adequate information regarding potential project-related cumulative effects on anadromous fish downstream of Crocker-Huffman diversion dam. Commission staff also stated that if anadromous fish are reintroduced to the project area at a later date, the Commission may require additional studies to assess project effects.

FWS/NMFS Dispute: FWS and NMFS request that MID conduct an assessment of floodplain habitat availability in the Merced River between Crocker-Huffman diversion dam and the confluence with the San Joaquin River.

Water Board Dispute: The Water Board states they support the disputes filed by NMFS for this study and that the information collected through implementing this study would establish whether or under what conditions the beneficial uses assigned to the Merced River are adequately protected. The Water Board further states this information will aid in the development of the water quality certification.

Technical Conference Discussion: During the technical conference, MID stated that it was concerned about the number of fish mortalities that would occur through implementing the food habitat portion of this study and spoke to the existing instream flows studies already conducted on the lower Merced River. NMFS and FWS stated that information from this study was needed to assess the quality of the corridor habitat and/or existing spawning and rearing habitat that exists in the lower Merced River. NMFS and FWS also stated that the study results would assist these agencies in implementing section 18 of the Federal Power Act by providing important information needed to make a decision on whether to prescribe fishways for the project. The Water Board also reaffirmed that this information would be needed to make decisions pertaining to their authority under section 401 of the Clean Water Act.

Panel Discussion: The Panel discusses the reasoning behind their assessment of the scope of project-related effects and the need to collect baseline information downstream of Crocker-Huffman diversion dam in greater detail above (see *Introduction*). The Panel also concludes that information in the record and information presented at the technical conference has demonstrated that there is a nexus between project operations and certain project-related effects downstream of Crocker-Huffman diversion dam and that anadromous fish currently pass over Crocker-Huffman diversion dam, consistent with 18 C.F.R. § 5.9(b)(5). As previously discussed, the Panel supports the Commission's determination to implement the *Water Balance/Operations Model*, *Water Quality*, and *Water Temperature Model* studies, otherwise referred to as "cornerstone studies" by the Panel. The Panel believes implementing these studies with the Panel recommended modifications would be adequate to conduct an assessment of potential project-related

effects on water resources between Merced Falls Project and Crocker-Huffman diversion dam (P-2467) and downstream of Crocker-Huffman diversion dam.

Although the Panel is uncertain how the information collected by implementing this study would help to assist NMFS and FWS in determining whether to exercise their mandatory conditioning authorities under section 18 of the Federal Power Act through the project area, the Panel believes the study is within the authority of the Water Board under section 401 of the Clean Water Act since it pertains to water quantity.

However, the Panel believes this study as proposed appears to be too intensive to establish defensible relationships between three target flow releases and the growth, survival, and health of juvenile salmonids within the ILP timeframe. Further, information presented at the technical conference and in the record alludes to very low numbers of spawning adults, and thus their progeny, in the Merced River downstream of Crocker-Huffman diversion dam (Vogel, TR 254: 12-17). The proposed study would harvest 360 juvenile salmon on a weekly basis for approximately 14 weeks. This could lead to killing 5,000 juvenile salmon per year and could constitute a majority of a given year's recruitment to the population in a system with already very low numbers of returning adults. It is also highly unlikely that definitive study results could be established under the agency proposed study methods of using only three pulse flows.

In light of the above technical issues and currently low returning adult salmonid numbers, the Panel recommends modifying this proposed study to integrate it with the *Instream Flow (PHABSIM) Study*, which is addressed below, to assess the effects of alternative flows on fish habitat between Merced Falls dam and Crocker Huffman diversion dam and below Crocker-Huffman diversion dam downstream to Shaffer Bridge. The Panel further discusses its recommendations to integrate these studies below under *Instream Flow Study (PHABSIM) Study*.

In consideration of the record of information before us, the procedures set forth under 18 C.F.R. § 5.9(k), and the criteria of 18 C.F.R. § 5.9(b), we recommend that the Commission's Director of the Office of Energy Projects adopt the Panel's recommended modifications to this study as discussed above.

### **Study 3.7-Chinook Salmon Egg Viability Study**

**FERC Determination:** In the SPD, Commission staff states Crocker-Huffman diversion dam currently serves as the upstream barrier to anadromous fish migration and fish movement on the Merced River. Commission staff concluded the requested information would not inform the development of license requirements as required by study plan criteria 18 C.F.R. § 5.9(b)(5) and that both existing information and information collected as part of the proposed *Water Balance/Operations Model*, *Water Quality*, and *Water Temperature Model* studies would provide adequate information regarding potential

project-related cumulative effects on anadromous fish downstream of Crocker-Huffman diversion dam. Commission staff also stated that if anadromous fish are reintroduced to the project area at a later date, the Commission may require additional studies to assess project effects.

FWS/NMFS Dispute: FWS and NMFS request MID conduct an assessment of Chinook salmon egg survival in the spawning reach from Crocker-Huffman diversion dam at least to the current license compliance point, Shaffer Bridge, and preferably to the San Joaquin River.

Water Board Dispute: The Water Board states they support the disputes filed by NMFS for this study and that the information collected through implementing this study would establish whether or under what conditions the beneficial uses assigned to the Merced River are adequately protected. The Water Board further states this information will aid in the development of the water quality certification.

Technical Conference Discussion: NMFS and FWS stated that the study results would assist these agencies in implementing section 18 of the Federal Power Act by providing important information needed to make a decision on whether to prescribe fishways for the project. The Water Board also reaffirmed that this information would be needed to make decisions pertaining to their authority under section 401 of the Clean Water Act.

Panel Conclusion: The Panel discusses the reasoning behind their assessment of the scope of project-related effects and the need to collect baseline information downstream of Crocker-Huffman diversion dam in greater detail above (see *Introduction*). The Panel also concludes that information in the record and information presented at the technical conference has demonstrated that there is a nexus between project operations and certain project-related effects downstream of Crocker-Huffman diversion dam, consistent with 18 C.F.R. § 5.9(b)(5). As previously discussed, the Panel supports the Commission's determination to implement the *Water Balance/Operations Model*, *Water Quality*, and *Water Temperature Model* studies, otherwise referred to as "cornerstone studies" by the Panel. The Panel believes implementing these studies with the Panel recommended modifications would be adequate to conduct an assessment of potential baseline and project-related effects on water resources downstream of Crocker-Huffman diversion dam.

However, the Panel believes that implementing the *Chinook Salmon Egg Viability Study* at this time is premature and that the disputing agencies have not met the criteria required by 18 C.F.R. § 5.9(b)(5) based on a lack of demonstrated project-related effects. The Panel recommends that the "cornerstone" studies should first be implemented and analyzed to determine the magnitude of project-related effects on water quality, temperature, and hydrology downstream of Crocker-Huffman diversion dam. The Panel believes the results of those studies can be used to trigger the need for additional studies



such as the *Chinook Salmon Egg Viability Study*, which would evaluate if fall pulse flows improve egg viability and minimize straying of early arriving adult salmon. In other words, the Panel is aware of potential project-related effects downstream of Crocker-Huffman diversion dam, but prior to knowing the magnitude of these effects or the capability of the project to mitigate these effects, the Panel is hesitant to recommend studies such as the *Chinook Salmon Egg Viability Study*. Lastly, the Panel is uncertain how the information collected by implementing this study would help to assist NMFS and FWS in determining whether to exercise their mandatory conditioning authorities for fishways under section 18 of the Federal Power Act through the project area. However, the Panel believes the study is within the authority of the Water Board since it pertains to water quantity and habitat tied to promulgated beneficial uses under section 401 of the Clean Water Act.

In consideration of the record of information before us, the procedures set forth under 18 C.F.R. § 5.9(k), and the criteria of 18 C.F.R. § 5.9(b), we concur with the SPD and recommend that the Commission's Director of the Office of Energy Projects does not adopt the disputing agencies requests to adopt this study. However, we recommend the Commission utilize a phased approach as described above to address the potential need of this study in the future based upon the results of the "cornerstone studies." The Panel also notes that if the suggested *Gravel Sediment Budget and Mobility Study* is implemented by the parties as part of broader settlement negotiations, then the gravel supplementation study should include assessing substrate needs for anadromous fish eggs.

### **Study 3.8-*Instream Flow (PHABSIM) Study***

FERC Determination: In the SPD, Commission staff states Crocker-Huffman diversion dam currently serves as the upstream barrier to anadromous fish migration and fish movement on the Merced River. Commission staff concluded the requested information would not inform the development of license requirements as required by study plan criteria 18 C.F.R. § 5.9(b)(5) and that both existing information and information collected as part of the proposed *Water Balance/Operations Model*, *Water Quality*, and *Water Temperature Model* studies would provide adequate information regarding potential project-related cumulative effects on anadromous fish downstream of Crocker-Huffman diversion dam. Commission staff also stated that if anadromous fish are reintroduced to the project area at a later date, the Commission may require additional studies to assess project effects.

FWS/NMFS Dispute: FWS and NMFS request that MID conduct an assessment of flow versus habitat relationships using a 1-D PHABSIM for steelhead and fall-run Chinook salmon with specific life stages of adult, juvenile, fry, and spawning.

Water Board Dispute: The Water Board reiterated the requests made by FWS and NMFS, as discussed above. The Water Board states collection of this information is needed to develop the water quality certification under the Clean Water Act and insufficient information exists in MID's PAD. The Water Board also states the study plan criteria required by 18 C.F.R. § 5.9(b)(5) includes indirect and cumulative effects and that certain streamflow requirements in the existing license provide evidence of an existing nexus. The Water Board further states collecting this information would be consistent with the methodologies used in other relicensing proceedings.

Technical Conference Discussion: During the technical conference when queried whether Commission staff had sufficient information to assess the effects of alternative flow scenarios on fish habitat from Merced Falls downstream to Shaffer Bridge, Mr. Buhyoff (Commission staff), noted that information that establishes a relationship between instream flow and fish habitat did not exist and that a study such as this could be triggered after first determining the operating parameters of the Merced River Project (P-2179). Mr. Buyoff also noted that the Commission is considering doing this type of study in conjunction with the Merced Falls Project (P-2467) (TR 265: 7 – 25; 266: 1 – 4). NMFS and FWS stated that the study results would assist these agencies in implementing section 18 of the Federal Power Act by providing important information needed to make a decision on whether to prescribe fishways for the project. The Water Board also reaffirmed that this information would be needed to make decisions pertaining to their authority under section 401 of the Clean Water Act.

Panel Conclusion: The Panel discusses the reasoning behind their assessment of the scope of project-related effects and the need to collect baseline information downstream of Crocker-Huffman diversion dam in greater detail above (see *Introduction*). The Panel also concludes that information in the record and information presented at the technical conference has demonstrated that there is a nexus between project operations and certain project-related effects, including hydrology and therefore potentially fish habitat, downstream of Crocker-Huffman diversion dam, consistent with 18 C.F.R. § 5.9(b)(5).

The Panel believes a study that allows one to conduct an assessment of the effects of alternative flow scenarios to fish habitat is an essential piece of information in conducting an assessment of changes to project operations on fish habitat. The recommended approach to conducting such an assessment is to integrate the operational hydrology output from the *Water Balance/Operations Model Study* with the habitat information from the *Anadromy Salmonid Habitat Study*, or the habitat assessment conducted by Stillwater Sciences (2008) as the Panel previously recommended, with a model that integrates fish habitat over a range of flows. The recommended modeling effort should include at least two study sites: one upstream of Crocker-Huffman diversion dam and one downstream of Crocker-Huffman diversion dam. The scope of the study should cover a wide range of flows from projected low flows, if the compliance

point is moved, over the range of flows needed to potentially assess fish habitat conditions in the floodplain.

The Panel recommends that the Commission modify this study to include two study sites: one upstream and one downstream of Crocker-Huffman diversion dam and to combine this study with the *Salmonid Floodplain Rearing Study*, as previously discussed. For the proposed study site upstream of Crocker-Huffman diversion dam, the analysis could focus on resident fish and Pacific lamprey. For the proposed study site downstream of Crocker-Huffman diversion dam, the analysis should include anadromous salmonids, native California fish, along with potential non-native fish such as largemouth bass and green sunfish. Based on the results of the *Water Balance/Operations Model Study*, the proposed changes in the compliance point could affect flows downstream of Crocker-Huffman diversion dam. The proposed PHABSIM would assess if the potential flow changes shift the riverine habitat to more favorable conditions to non-native piscivorous fish such as largemouth bass. The Panel further recommends that MID collate available fish habitat use or suitability curves from other proceedings on West Slope Sierra Rivers since developing Merced River specific curves is limited by the low numbers of fish in the system. The Panel is aware that an earlier PHABSIM study on Chinook salmon spawning was conducted on the lower Merced River and that those habitat suitability curves should be available for use in this proceeding (Gallagher and Gard 1999). The parties can develop a process to revise desired fish habitat suitability curves to suit Merced River conditions if available curves are deemed to not be as representative as desired. The Panel further recommends that MID employ a 2-dimensional hydraulic model since those models more accurately replicate hydraulic features than 1-dimensional models as proposed by the agencies. A 2-dimensional model will simulate conditions much better up in the floodplain or other areas with large boulders or vegetation that may be temporarily flooded during high flow events.

The Panel further believes that implementing the “cornerstone” studies would determine the magnitude of project-related effects on water quality, temperature, and hydrology downstream of Crocker-Huffman diversion dam. The Panel further believes that implementing the *Instream Flow (PHABSIM) Study* would determine the relationship between flows and fish habitat in this reach. If the results of the cornerstone studies establish a more direct effect on downstream floodplain habitat, then the Panel recommends the *Instream Flow (PHABSIM) Study* be expanded into the floodplain downstream of Crocker-Huffman diversion dam. The Panel concludes that this information would provide valuable information to assess the effects of alternative operating scenarios compared to the baseline condition.

In consideration of the record of information before us, the procedures set forth under 18 C.F.R. § 5.9(k), and the criteria of 18 C.F.R. § 5.9(b), we recommend that the Commission’s Director of the Office of Energy Projects adopt the Panel’s recommended modifications to this study as discussed above.

## Attachment B

### Summary of Panel Recommendations for Studies in Dispute

Study	Recommendation	Panel Note
1. Hydrologic Alteration Study	Resolved	
2. Water Balance/Operations Model Study	Y/M <sup>1</sup>	Move scope of study downstream to Shaffer Bridge (RM 32.5)
3. Water Quality Study	Y/M	Move scope of study downstream to Shaffer Bridge (RM 32.5)
4. Water Temperature Model Study	Y/M	Move scope of study downstream to Shaffer Bridge (RM 32.5)
5. Bioaccumulation	Concurs w/SPD	
6. Riparian Habitat and Wetlands Study	Resolved	
7. Reservoir Water Temperature Management Feasibility Study	Phased	Study to be triggered based on results of “cornerstone studies”
8. Gravel Sediment Budget and Mobility Study	Y/M	Tier to Stillwater (2001) by adding a study site between Merced Falls and C-H and a reference site <sup>2</sup>
9. Upper River Fish Populations and Habitat Study	Concurs w/SPD	
10. Anadromy Salmonid Habitat Study	Y/M	Review Stillwater (2008) to determine need for study and if needed expand scope of study downstream to Shaffer Bridge (RM 32)
11. Anadromous Conservation Hatchery Study	Concurs w/SPD	
12. Anadromous Fish Passage Study	Concurs w/SPD	
13. Anadromous Fish Passage Facilities Study	Concurs w/SPD	
14. Salmonid Floodplain Rearing Study	Y/M	Modify scope and combine with PHABSIM study
15. Chinook Salmon Egg Viability Study	Phased	Conduct of study to be triggered based on results of “cornerstone studies”
16. PHABSIM	Y/M	Modify proposed methods and include analysis of habitat conditions upstream of C-H and downstream to Shaffer Bridge (RM 32.5)

<sup>1</sup> Y/M=Yes, with modifications, see Panel Note

<sup>2</sup> C-H=Crocker-Huffman diversion dam

## Attachment C

### Submittal by Robert H. Deibel (Independent Third Party Panelist)

For this proceeding, FERC declined to support agency supported studies such as the habitat survey upstream of Lake McClure. The agencies requested the information as part of their attempt to build a substantial evidence record to determine the need for, the potential success of, and the specific type of fish passage facility needed to meet agency objectives. If a licensee were to petition either the Department of Commerce or the Interior challenging the factual basis in a trial type hearing of either NMFS or FWS requiring a fishway prescription, they presumably could do so based on the lack of site-specific studies. The agencies could respond by noting that targeted studies were requested and either not supported by FERC or directly opposed by the licensee and therefore, NMFS and the FWS relied on the best available information to make their determination of need for and type of mitigation needed to meet agency objectives regarding fish passage.

The amendments to the Federal Power Act by the Energy Policy Act of 2005 impose an additional administrative process on Federal Agencies with mandatory conditioning authority with the inclusion of the trial type hearing. This is an expedited hearing based on the record in a proceeding and is designed to have an Administrative Law Judge decide on the factual evidence used by mandatory conditioning agencies to support their conditions. FERC administers licensing proceedings such as the Merced River Hydroelectric Project as governed by the Integrated Licensing Process (ILP) regulations (18 C.F.R. § 5.1 – 5.31). By administering the proceedings under the ILP, FERC controls what studies are conducted by the licensee from which to assess the effects of a given project and studies that may be needed by mandatory conditioning agencies such as NMFS or FWS to use in their deliberations to assess the need for mitigation and then serve as the basis for potential project specific mitigation. The filings in the Merced River Hydroelectric Project and statements by FERC staff at the technical conference illustrate the potential regulatory dilemma for mandatory conditioning agencies to obtain site-specific substantial evidence in the record. FERC staff stated that site-specific mitigation can be accomplished through the license order by requiring a feasibility study after the license has been issued. The requirement to have a licensee develop site-specific mitigation after the license is issued essentially eliminates the opportunity for an applicant to petition agencies for a trial type hearing on the facts supporting a mandatory condition. The mandatory conditioning agencies would rely on existing information to develop preliminary terms and conditions, some of which may be more generic than site-specific. The existing information could be just as defensible especially if the agencies requested the site-specific studies and the applicant opposed those studies and FERC did not approve those studies. The agencies would note that in their justification supporting their preliminary terms and conditions. Therefore, there appears to be a sequencing issue based on the filings and comments for this proceeding.

Reliance on post-licensing plans to develop site-specific conditions after the license order is issued is after the procedural timeline for request for a trial type hearing and project specific matters such as environmental effects due to construction or potential success of a specific mitigation measure would not be available for FERC to address in its project NEPA document.

The phased approach as discussed by FERC staff at the technical conference could be one way to include studies that assess the effects of a project and then produce information to develop project-specific mitigation as part of the approved season one studies (18 C.F.R § 5.13). The phased approach would first yield information to determine project-related effects and then provide for an approved trigger to initiate the additional studies that agencies with mandatory conditioning authority may use to determine the need for and type of mitigation necessary to mitigate for site-specific project induced effects to resources the respective agencies administer.

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