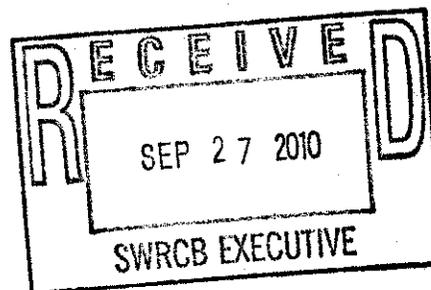


**DEPARTMENT OF WATER RESOURCES**

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September 27, 2010



Ms. Jeanine Townsend, Clerk to the Board  
State Water Resources Control Board  
P.O. Box 100  
Sacramento, California 95812-0100  
Via email: [commentletters@waterboards.ca.gov](mailto:commentletters@waterboards.ca.gov)

**COMMENT LETTER - OROVILLE DRAFT WATER QUALITY CERTIFICATION**

Dear Ms. Townsend:

On January 21, 2010, the State Water Resources Control Board (Board) issued a draft Water Quality Certification (WQC) for the relicensing of the Oroville Facilities, Federal Energy Regulatory Commission (FERC) Project No. 2100. After receiving comments from the Department of Water Resources (DWR) and other interested parties, the Board issued a new WQC draft on July 2, 2010. On July 9, 2010, the Board issued a letter responding to public comments on the January 21 draft WQC.

DWR appreciates that the Board considered and responded to several of DWR's comments and modified several of the terms and conditions during the review of the draft WQC. However, DWR continues to be deeply concerned that some of the conditions in the draft WQC do not accurately reflect the documented analyses and studies developed by participants in the Oroville relicensing process (which included regulatory agencies and a Board staff member) and thus are inconsistent with the proposed license requirements contained in the Settlement Agreement for Licensing of the Oroville Facilities (Settlement Agreement, March 2006). Several key conditions in the July draft WQC would cause inconsistent implementation between requirements of the Settlement Agreement and the WQC. In effect, if adopted, the draft WQC would materially modify several of the key provisions of the Settlement Agreement, and in DWR's view, adversely alter the carefully balanced package of resource and human benefits provided by the Settlement Agreement.

DWR has provided detailed comments on these concerns in our February 23, 2010, and April 8, 2010, comments and DWR incorporates these comments by this reference into these September 27 comments. DWR will provide these comments again to the Board upon request. For convenience, DWR has restated some of these past comments in the Background and Summary below. In addition, DWR has attached comprehensive Detailed Comments supporting DWR's rationale for requesting that the Board revise the July draft WQC to use the same terms and conditions as described in the Settlement Agreement. Most importantly, DWR requests that the Board revise the WQC so that

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certain temperature requirements are target temperatures until facility modifications are completed, and to delete the requirement for implementing a plan for salmon habitat enhancement which DWR and the National Marine Fisheries Service (NMFS) have proposed pursuant to the Federal Power Act Section 18 and are not necessary for satisfying DWR's obligations under Clean Water Act Section 401.

In addition, some key Parties to the Settlement Agreement have recently affirmed their continued support for the Settlement Agreement or specific provisions of the Settlement Agreement. On September 22, 2010, DWR received a letter from the United States Department of Interior supporting the Settlement Agreement (see attached letter dated September 21 to Henry Ramirez), while the Kon Kow Valley Band of Maidu also has expressed its written support. DWR understands that the NMFS and the Department of Fish and Game (DFG) will, or have, submitted letters to the Board with their support for maintaining the Settlement Agreement approach for implementing provisions for the Habitat Expansion Agreement.

### **Background and Summary**

The Settlement Agreement, signed by 51 organizations and 2 individuals (Settlement Parties), is the culmination of years of intense collaborative efforts, studies and negotiations among a broad and diverse array of stakeholder interests, including State and federal resource agencies, local governments and residents, tribal interests, non-governmental organizations, and water contractors. The signatories to the Settlement Agreement agreed that it is a comprehensive agreement that, by its own terms, resolves all issues that have, or could have, been raised by the Settlement Parties in connection with FERC's issuance of a new license to DWR.

The Settlement Parties agree in the Settlement Agreement that the environmental protection, mitigation and enhancement (PM&E) measures proposed for the new Oroville Facilities license are fair, reasonable, and in the public interest, satisfy applicable state and federal regulatory requirements, and represent an appropriate balance of beneficial uses of the waterway. In addition to the numerous PM&E measures recommended to be included in the new license (Settlement Agreement Appendix A), the Settlement Agreement includes a number of PM&E measures and other commitments the Settlement Parties believe to be outside of FERC's jurisdiction or otherwise inappropriate to be in the new license (Settlement Agreement Appendices B, F). The Settlement Agreement stipulates that if the WQC or FERC license materially modifies the Appendix A Proposed License Articles by changing, deleting, or adding new requirements not included in the Settlement Agreement, a Party may ultimately withdraw from the Settlement Agreement. If DWR withdraws from the Settlement Agreement, the Settlement Agreement terminates. This would terminate DWR's contractual obligations under Appendix B, including its substantial obligation to fund local economic development projects under the Supplemental Benefits Fund. A

material modification to the Settlement Agreement also could trigger withdrawal and termination of the following related agreements: *The Habitat Expansion Agreement for Central Valley Spring-Run Chinook Salmon and California Central Valley Steelhead* (August 2007) (HEA); and *Amendment to Agreements on Diversion of Water from the Feather River and Settlement of Issues Related to the Temperature of Water Diversions* (April 23, 2008).

The Board's July 2, 2010 public review draft of the WQC adopts most of the PM&E measures in the Settlement Agreement Appendix A, but would create a number of material modifications to the Settlement Agreement with potential for Parties to withdraw and lead toward termination of some beneficial activities. Significant material modifications are summarized below:

- Draft WQC Condition S8 would modify Proposed License Article A108 (under the Settlement Agreement) by making Low Flow Channel (LFC) *target* temperatures prior to Facilities Modification into firm *requirements*. If the Licensee is unable to meet these requirements, it must submit to the Board for approval an interim operations plan to reduce temperatures and demonstrate to the Board that it cannot achieve the temperature requirements using current facilities. Since DWR and the other Settlement Parties already know that DWR cannot consistently achieve those temperatures using current facilities, Condition S8 as currently drafted accomplishes nothing, but creates FERC compliance problems for DWR as well as reduces DWR's operational flexibility to maximize use of the Lake Oroville coldwater pool, thereby reducing species protection.
- Condition S8 also would modify Proposed License Article A108 by requiring DWR to develop for Board approval an interim plan and temperature table for the High Flow Channel (HFC) pending Facilities Modification. The Settlement Agreement contains no such obligation, for good reason. The Settlement Agreement recognizes that the ability to reduce temperatures in the HFC is dependent on Facilities Modification and can only be verified post-Facilities Modification through testing. The requirement for an interim plan imposes unnecessary and pointless requirements on DWR.
- Condition S9 would make the HEA a requirement of the WQC and thus a requirement of the FERC license, in contradiction to the Settlement Agreement under which the HEA would be implemented outside the FERC license. This subjects the HEA to Board and potentially FERC approval, thus creating the possibility of conflict with whatever final plan is agreed to by the NMFS and other parties to the HEA, as well as potentially expanding the Oroville FERC project boundary into areas far remote from the Oroville Facilities.

- Condition S7 requires DWR to develop a plan and schedule for repairing the river valve for temperature control or propose an equivalent temperature control method subject to the Board's approval. The Settlement Agreement does not require DWR to use the river valve at all costs, but retains DWR's discretion and control over engineering and safety aspects of the Oroville Facilities operations while still imposing an obligation to meet requirements.
- The draft WQC would override the Ecological Committee consensus process by reserving final approval of all license implementation plans to the Board. The requirement and schedules to obtain Board approval before submitting any plan to FERC may result in DWR being unable to meet FERC deadlines and being out of compliance with the license.

At the request of Board staff assigned to the Oroville Facilities settlement negotiations, the Settlement Agreement included as Appendix D, a SWRCB Collaborative Process Participation Statement. Appendix D states:

"It is the policy of the SWRCB to promote voluntary settlements among the parties to adjudicative proceedings before the SWRCB." It further states: "The SWRCB will participate in the collaborative process with a view toward encouraging settlement among the parties and other persons interested in proceedings before the SWRCB." While Appendix D clearly reserves authority to the Board to make a final adjudicative decision based on "its obligation to consider any arguments that may be raised or information provided by parties to a SWRCB proceedings," no party or commenter in this 401 certification proceeding has advocated for -- or provided any information in support of -- the material modifications of the Settlement Agreement that would result under the draft WQC. There appears to be no compelling reason or policy advantage for the Board to issue a final WQC in conflict with the collective technical expertise of regulatory agencies, including Board staff, reflected in the Settlement Agreement.

The Board has proposed conditions in the WQC that are different than those in the Settlement Agreement based upon its determination that the Settlement Agreement conditions are either not enforceable, will not protect the beneficial uses, or will not meet water quality standards in a timely manner. DWR believes the Board's determinations are based upon incorrect information or a misinterpretation of various reports cited by the Board. DWR's attached Detailed Comments include facts that demonstrate the beneficial uses in the Basin Plan are being met, and are expected to improve as a result of the Settlement Agreement. This is especially true for the water temperatures in the Lower Feather River. Although the terms and conditions of the Settlement Agreement are designed to improve future temperature conditions in the Feather River, currently both the Feather River LFC and HFC support all salmonid life stages. The Oroville Project as currently operated has the ability to support a great number of salmonids, as

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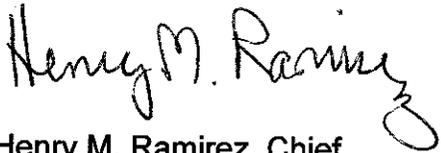
evidenced by the high number of returning salmon in 2001. Further, the NMFS has determined that the Feather River is and will continue to be an important node of habitat for both the survival and recovery of listed species.

The draft WQC continues to unnecessarily include requirements that DWR plan for additional habitat for spring-run Chinook salmon in accordance with DWR's Habitat Expansion Agreement. DWR's attached Detailed Comments show that the existing conditions in the lower Feather River support a viable spring-run population, and that the numbers of spring-run that are currently in the river are well within the historical numbers of spring-run that spawned in the Feather River, both before the construction of Oroville dam, and before European settlement. This information supports DWR's rationale for not including the additional habitat requirements in the WQC.

DWR's comments demonstrate that conditions in the Feather River will be improved through the implementation of the Settlement Agreement as currently drafted and that the existing conditions support the beneficial uses set forth in the Basin Plan. Therefore, DWR respectfully requests that the Board consider DWR's previous and current comments to support revising the July draft WQC to be consistent with provisions in the Settlement Agreement. As noted above, DWR is concerned that as proposed the WQC could result in withdrawals from and termination of the Settlement Agreement, the HEA, and other significant commitments among DWR and the Settlement Parties, with a consequent loss of important benefits for the community and the environment.

Thank you for this opportunity to comment on the proposed WQC that is of immense importance to California's resources and its infrastructure.

Sincerely,



Henry M. Ramirez, Chief  
Hydropower License Planning and Compliance Office  
Executive Division

Attachments

**Department of Water Resources**  
**Detailed Comments on July 2010 Draft Water Quality Certification**

**Section 1 – The Project currently protects cold freshwater habitat (cold) beneficial use and the Settlement Agreement targets improve upon those conditions**

In the draft WQC, the Board states that it prepared a draft WQC that changed certain terms and conditions in the Settlement Agreement based upon a determination that the measures contained in the Settlement Agreement are either not enforceable, will not protect beneficial uses, or will not meet water quality standards in a timely manner. As will be shown below, this determination is incorrect, especially with regard to Condition S8.

**Section 1.1 – Modifications to the Settlement Agreement by Condition S8 are unwarranted because the references and conclusions relied upon by the Board do not support findings that beneficial uses are not being met**

In making its determination for the need to modify certain measures in the Settlement Agreement, it appears that the Board relied upon references which have been superseded by more recent and more in-depth reports, misinterpreted the results of other reports, or mischaracterized conditions in the Project area. Most notably, page 11, paragraph 3 of the draft WQC states, "*Operation of the Project currently does not protect the cold-water beneficial uses. Populations of Sacramento/San Joaquin Valley Chinook salmon are at the lowest levels ever recorded.*" This statement in the draft WQC implies that there is a causal connection between the conditions in the Low Flow Channel (LFC) and High Flow Channel (HFC) and the general decline of salmonid populations in the Central Valley, leading the Board to change the terms in the Settlement Agreement in order to address this decline. While it is true that populations of Central Valley Chinook salmon are currently at extremely low levels historically, there is no evidence that flow or temperature conditions in the LFC or HFC have contributed to the very recent and rapid decline in population levels. To the contrary, under the same water temperature and flow conditions that now exist in the lower Feather River, populations of Chinook salmon in the Feather River were at record highs in the early 2000's with roughly 200,000 Chinook returning to the Feather River and Feather River Fish Hatchery in 2001 (DWR 2002a and DFG 2002). Because the project operations and conditions have not changed since the period of record salmonid population levels in the lower Feather River, it is implausible that the operation of the Oroville Facilities has played even a minor role in the recent salmonid population collapse.

The recent and rapid decline in the salmonid population demonstrates that there is a more acute cause for the decline. The report "What Caused the Sacramento River Fall Chinook Stock Collapse" written by staff from NMFS, U.S. Fish and Wildlife Service (USFWS), DFG and academia (Lindley et al 2009) attributed most of the Sacramento River Fall Chinook (SRFC) decline to anomalous coastal ocean conditions that caused periods of weak upwelling, warm sea surface temperatures and low densities of prey

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base. The report states "Using this framework, all of the evidence that we could find points to ocean conditions as being the proximate cause of the poor performance of the 2004 and 2005 broods of SRFC" (Lindley et al 2009; page 4, paragraph 2, line 24). They also state that "fishery management also played a role in low escapement of 2007" (Lindley et al 2009; page 5, paragraph 1, line 46) and that "while not the cause of the 2004 brood weak year-class strength, contributed to the failure to achieve the SRFC escapement goal in 2007" (Lindley et al 2009; page 5, paragraph 1, line 54).

The SRFC stock collapse paper also reported that climate variability, degradation of freshwater and estuarine environments and heavy reliance on hatchery production were also likely contributors to the collapse of the stock (Lindley et al 2009; page 5, paragraphs 2 and 3), and that "climate variability plays an important role in the inter-annual variation in abundance of Pacific salmon, including SRFC" (Lindley et al 2009; page 5, paragraph 3, line 71). The paper noted that "conditions in freshwater were not unusual, and a measure of abundance at the entrance to the estuary showed that, up until that point, these broods were at or near normal levels of abundance" (Lindley et al 2009; page 4, paragraph 3, line 30).

Through the Feather River Fish Hatchery Genetics Management Plan (HGMP) process set forth in the Settlement Agreement, as well as the through the Federal Endangered Species Act salmon and steelhead 4(d) rule, DWR is aggressively addressing the broodstock selection, production and release strategies for Central Valley spring-run Chinook, Central Valley fall-run and Central Valley steelhead produced at the Feather River Fish Hatchery to help alleviate some of the concerns with hatchery production and release strategies discussed in the report. The HGMP is designed to address the issue of "take" of ESA-listed species that may occur as a result of artificial propagation activities, such as production of spring-run Chinook at Feather River Hatchery (NMFS 2010). It is anticipated that significant changes in Feather River Fish Hatchery operation along with the significant enhancements to the lower Feather River set forth in the Settlement Agreement will greatly improve the ability of the Feather River system to produce wild Chinook and steelhead that are more diverse in life history and therefore more resilient to conditions that are likely to be encountered in the marine environment in years to come.

In addition to its finding in the draft WQC discussed above, the Board has recently reiterated its belief that the beneficial uses are not currently met. In a letter to DWR dated July 9, 2010, page 5, paragraph 4, the Board asserted, "...there is substantial evidence in the EIR and the application for water quality certification that current operation does not protect certain beneficial uses." Similarly, the letter from the Board also asserted, "The record contains significant information on the impacts of elevated water temperatures..." In the letter, the only support the Board appears to give to the above two assertions is a passage it cites from the Draft Environmental Impact Report (DEIR), "The water temperature regime associated with the baseline operations of the

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Oroville Facilities may (emphasis added) expose pre-spawning adult salmonids to elevated water temperatures that can (emphasis added) adversely affect production (e.g. increased pre-spawn mortality, decreased fertilization, egg retention). Existing operations may (emphasis added) also expose pre-spawning adult Chinook salmon to elevated water temperatures during the holding time period, which may (emphasis added) adversely affect reproductive success. Water temperatures also can (emphasis added) directly affect the spawning and incubation periods of salmonids, as well as the distribution of salmonid spawning and rates of egg and alevin survival. Rearing juveniles exposed to high water temperatures may (emphasis added) experience acute direct mortality or sublethal chronic thermal stress, which can (emphasis added) be evidenced through indicators such as disease outbreaks, reduction in growth and food conversion efficiency and hyperactivity or disorientation.”

The Board is citing statements in the DEIR which characterize the effects upon salmonids that can or may occur with water temperature exposures above certain levels. Water temperatures associated with these thresholds for water temperature exposure can and do occur in the lower Feather River. However, the Board's use of this citation indicates that it has concluded from the DEIR that the existing conditions have caused these impacts. This is not the case. The DEIR disclosed (appropriately) that these types of impacts could occur, but made no finding that they are occurring. In fact, it is imperative to note that the DEIR found that the “Current operations of the Oroville Facilities supports and reasonably protects, or has no adverse effect on (as in the case of coldwater spawning in Lake Oroville), all beneficial uses specified in the Basin Plan for Project waters and are described below” (DEIR, Section 4.2.2, page 4.2-15, paragraph 1). This conclusion is supported by many of the findings in the environmental impact section, most notably: “As discussed in Section 4.2.2, Surface Water Quality Environmental Setting, current facility operations are reasonably protective of Basin Plan objectives.”

The Board has also modified elements of the Settlement Agreement which address the HFC defined as the reach between the Thermalito Afterbay Outlet and the southern FERC boundary, based upon a misperception that the HFC does not support beneficial uses. Page 11, paragraph 3, of the draft WQC states, “Studies have shown it is unlikely that adult Chinook salmon can use the Feather River below the Thermalito Afterbay Outlet except as a migration corridor.” Similarly, in the Board letter to DWR dated July 9, 2010 (SWRCB 2010, page 9, paragraph 4), the Board stated, “Based on water temperature modeling for years 2000 and 2001 the Bureau of Reclamation concluded that it was unlikely that adult Chinook salmon would use the Feather River below the Thermalito Afterbay Outlet except as a migratory corridor.”

These statements are inaccurate and are a substantial mischaracterization of the conditions in the HFC. The HFC is very productive with regard to Chinook salmon spawning and rearing. DWR has been studying the spawning and emigration patterns

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of salmonids in the lower Feather River for approximately 13 years and therefore has a tremendous data set demonstrating this productivity (DWR 2002a, DWR 2002b, DWR 2003a, DWR 2004a, DWR 2005a, DWR 2006a, DWR 2007a, and DWR 2007b). Escapement estimates of fall-run Chinook for the HFC have been as high as 68,031 in 2001 (DWR 2002a, page 1, paragraph 2). Emigration estimates of naturally spawned juvenile Chinook for the entire lower river have been as high as 29 million in 2001 and 29.3 million in 2004 (DWR 2002b, Table 6; DWR 2007b, page 30 Table 3) with roughly half of the juveniles originating from the HFC. Considering the majority of adult Chinook spawn in the LFC (most likely due to its proximity to the Feather River Fish Hatchery and upstream-most portion of the spawning grounds) it is even more impressive that the HFC almost always produces more juvenile Chinook than the LFC. This high HFC productivity is probably due to reduced competition for spawning habitat and higher quality spawning gravel.

More evidence demonstrating the productivity of the HFC comes from Chinook redd excavation studies conducted in 1998 (Kindopp, 1999). These studies demonstrated that intra-gravel egg survival (during early developmental stages) of fall-run Chinook in the HFC was over 95 percent, further demonstrating the value of the HFC as quality Chinook habitat (Kindopp, 1999, page 37, Figure 12). Seesholtz et al (2004) also reported significant use of the HFC by both salmonids and other native fishes. DWR emigration studies show that juvenile Chinook in the Feather River, like most other Central Valley rivers, typically exhibit an ocean type life history pattern where the juveniles emigrate downstream soon after emergence from the gravel. However, a small percentage of Chinook and steelhead continue to rear in the LFC and HFC well into the spring and summer (DWR 2002b, DWR 2004b, DWR 2007b, DWR 2009a and DWR 2009b).

The Board has also raised concerns regarding elevated water temperatures in the lower Feather River. In the draft WQC, page 11, paragraph 3, the Board states, "*DWR concluded that increased incidence of disease, developmental abnormalities, increased in-vivo egg mortality, and temporary cessation of migration could occur due to elevated water temperatures in some areas of the lower Feather River.*"

The information reported in the Preliminary Draft Environmental Assessment (PDEA) (2005e, Volume III, Chapter 5, pages 5.5-17 and 5.5-18) is not a conclusion. The report **was appropriately disclosing that elevated water temperatures "could" result in these types of affects.** The report did not conclude that these impacts were occurring nor has there been any evidence presented documenting that these impacts are occurring.

It should be noted that in any river system, given the right circumstances, these types of maladies could occur. It is important to note that the lower Feather River is 67 miles long, the majority of that being downstream of the DWR FERC project boundary. The Oroville project cannot influence water temperatures very far beyond the southern

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FERC boundary, let alone all the way to the confluence with the Sacramento River. While there is a possibility that under the right circumstances elevated water temperatures could result in one of the described conditions, studies looking at conditions in the Feather River (DWR 2004b, DWR 2004c, DWR 2004d, DWR 2005b, DWR 2004e, DWR 2004f and DWR 2004g) have found no evidence that the types of impacts referred to above have ever occurred in the Feather River as a result of increased water temperatures or other environmental conditions. More specifically, the review done on the effects of the State Water Project (Project) on fish diseases (DWR 2004h) demonstrated that the Feather River Fish Hatchery has been successful at managing disease concerns. Feather River Fish Hatchery annual reports indicate that DFG has been able to meet production goals and has had no unusual instances of egg mortality related to water temperature within its facilities (DFG 2001, DFG 2002, DFG 2003, DFG 2004a, DFG 2005, DFG 2006, DFG 2007 and DFG 2008). There is also no indication from any report that either emigration or immigration has been delayed due to elevated water temperatures in the lower Feather River (DWR 2002b, DWR 2007b, DWR 2009a, DWR 2009b and DWR 2005b).

In the draft WQC, Appendix A, page 4, paragraph 1, the Board states, "*The EIR did not identify an alternative to protect the COLD beneficial use without facility modification.*" This seems to imply that the Board believes that DWR must implement a facility modification as called for in Article A108 of the Settlement Agreement in order to protect the Cold beneficial use in the Feather River, and that in the interim it is necessary to identify an alternative to protect the Cold beneficial use in the Feather River.

There are several misperceptions embedded in this statement. First, in the FEIR, previous responses to the draft WQC (DWR letter to Board dated February 23, 2010) and this response to the Board demonstrate that the Cold beneficial uses are protected under the existing conditions. Second, all alternatives in the FEIR included not only enhancements to the water temperature targets prior to facilities modifications, but also substantial habitat restoration and enhancement actions that will increase the protection of Cold beneficial uses. Third, once the improvements to the water temperature management actions in the Settlement Agreement are implemented, the only opportunity for additional water temperature improvements will be through facilities modifications. The interim operational changes in water temperature management prior to the facilities modifications will optimize the potential for beneficial Cold uses of the currently accessible coldwater pool. The only additional method for increasing the level of protection above those provided in the targets in the Settlement Agreement Table 1 and habitat enhancements are to construct facilities modifications that will increase access to coldwater resources or reroute coldwater pool deployment.

Although the draft WQC Table S8 water temperatures for Robinson Riffle (the current water temperature compliance location in the lower LFC) are consistent with the water temperatures included in the Settlement Agreement A108 Table 1, the draft WQC

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Condition S8 unnecessarily changes the Settlement Agreement targets for interim operations prior to the completion to facilities modifications into compliance requirements. The draft WQC Condition S8 includes a one-year grace period for DWR to submit a plan for revised water temperature objectives. Since the limitations of the existing facilities were thoroughly studied in the Settlement Agreement negotiations and in the Reconnaissance Study of Potential Future Facilities Modifications (DWR 2006c), barring new information, the 1 year report request for changes to the water temperatures at Robinson Riffle should be expected to look just like the Settlement Agreement Article A108 since it already optimizes the facilities operations for the protection of Cold beneficial uses and has the concurrence and support of the fisheries agencies.

In many years DWR expends nearly all of the currently accessible coldwater pool in Lake Oroville. While the proposed operations in the Settlement Agreement will optimize the use of the limited coldwater pool resources, it is not possible to consistently and reliably make conditions colder in the LFC and HFC than set forth in the Settlement Agreement until facilities modifications are completed (see Condition S7 Response). It should be noted that water temperature targets were set for Robinson Riffle in the Settlement Agreement Article A108.1, Table 1), as well as the Oroville Dam Draft Biological Opinion (BiOp) (NMFS 2009), in recognition of the fact that the facilities cannot meet these water temperatures as requirements under all conditions.

Although the temperature targets proposed in Table 1 of the Settlement Agreement and Table S8 are potentially more protective of salmonids in the LFC, there is no evidence that these water temperature requirements are *necessary* in order to protect the Cold beneficial use as defined in the Basin Plan. By utilizing the water temperature management actions established in Settlement Agreement Article A108.1(b) (DWR 2006b) including: (i) curtailing pumpback operation, (ii) removing shutters on Hyatt Intake, and (iii) increasing flow releases in the LFC up to a maximum of 1500 cfs, DWR would be taking the same actions it has in the recent past operations that have proven successful for achieving the 65°F temperature compliance at Robinson Riffle (NMFS 2004). By attempting to meet the proposed targets in Settlement Agreement Table 1 as inflexible requirements, DWR would constantly be striving to operate more aggressively to provide an even more protective temperature regime than has been demonstrated to be successful in the past at providing quality spawning rearing, migration and holding temperatures for salmonids in the LFC. More importantly, however, Settlement Agreement Table 1 are water temperature targets and thereby allows DWR and the Ecological Committee the flexibility to balance all resource needs on a year-to-year basis as described above.

What concerns DWR about the change from the Settlement Agreement water temperature targets to the draft WQC condition water temperature requirements is the resulting loss of flexibility in the management of limited reservoir coldwater pool

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resources which is critical to the reliability of the project to protect Cold beneficial uses under a wide range of conditions. Although rearing and holding temperatures must be protective of Central Valley Chinook salmon and steelhead in the summer, the fall holding and egg incubation stages are more sensitive periods in the life-cycle for Central Valley spring- and fall-run Chinook salmon. As spring-run Chinook salmon enter and are held in the Feather River Fish Hatchery in the final two weeks of September and early October it is critical that coldwater is available (shutters are available to pull) to provide optimal holding temperatures.

As an example of the need for flexible water temperature management, due to low storage in Lake Oroville in 2009, DWR reduced summer releases to the Feather River to ensure that coldwater would be available in the fall to protect late season holding and egg incubation at the Feather River Fish Hatchery and in the river. If less flexible water temperature requirements were in place (63°F at Robinson Riffle instead of 65°F) DWR would have been required by the draft WQC condition to pull shutters earlier in the season, potentially leaving few, if any water temperature management options available to ensure the protection of the Cold beneficial uses for the fall. Any requirement for fixed water temperature requirements at Robinson Riffle below the 2004 OCAP BO condition (NMFS 2004) or NMFS Oroville Dam Draft BiOp condition (NMFS 2009) could result in the lack of sufficient coldwater pool resources necessary to meet the biological needs of Central Valley spring-run in the fall and could result in significant losses of Feather River Fish Hatchery spring-run broodstock and/or naturally spawned Central Valley spring-run eggs deposited in the LFC.

**Section 1.2 – Cold beneficial uses are protected under the existing license and Biological Opinions**

On page 5, of its July 9, 2010 letter to DWR, the Board asserted, "...there is substantial evidence in the EIR and the application for water quality certification that current operation does not protect certain beneficial uses." Similarly, the letter also asserted, "The record contains significant information on the impacts of elevated water temperatures..."

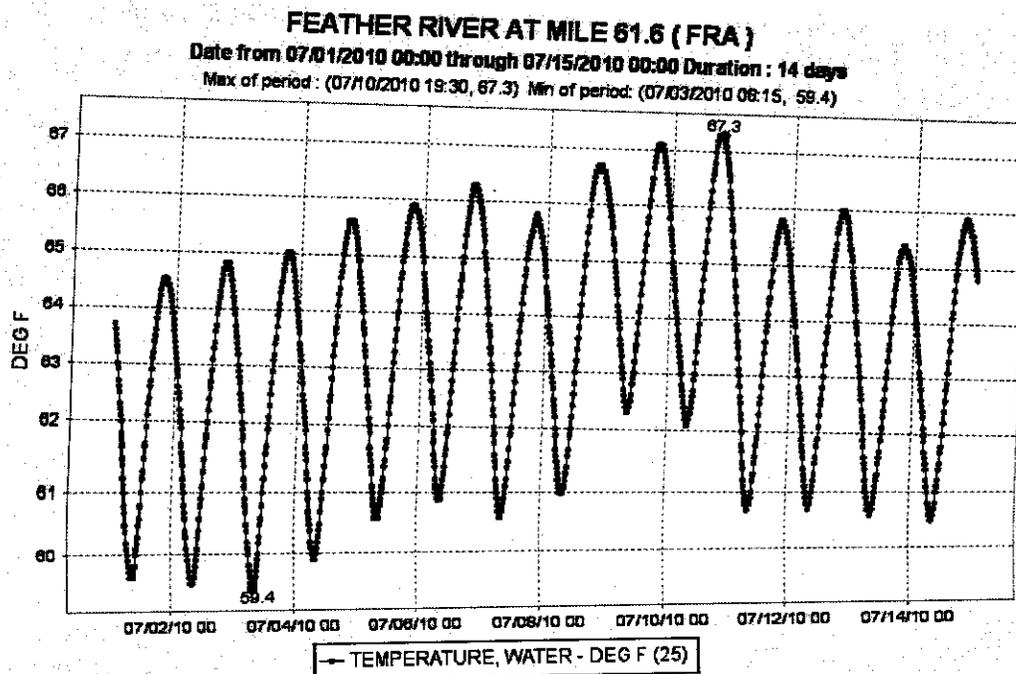
As discussed in the prior section of this response, the Cold beneficial uses in the lower Feather River are currently being met by the Project. That is not to say, however, that the water temperature conditions in the LFC and HFC are optimal at all times, in all locations and under all conditions. The difference in perception between the Board's statements and the actual conditions in the river may be in the Board's working (although undefined in the draft WQC) definition of "protection" of Cold beneficial uses. The water temperatures used for the analysis of fisheries resources in the relicensing study reports, DEIR and which were ultimately developed into the water temperature targets for the Settlement Agreement are water temperatures that the preponderance of available scientific literature shows there to be no adverse effects under chronic long-term exposure. These water temperature thresholds for long-term exposure were appropriate to use for the environmental review. These same long-term water

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temperatures are not useful as a determination of the level of "protection" if the exceedances of those water temperatures are of short duration. Short term exposure of fish to water temperatures warmer than these long-term exposure criteria do not necessarily result in any adverse affects to the fish. There is a preponderance of literature available on much higher water temperature thresholds that are appropriate for evaluating the potential adverse affects for short term exposures. An example of a compilation of many published reports on the relative affects of exposure to fish for short- and long-term exposures was included in the Relicensing Report SP-F3.2 Task 2 - Matrix of Life History and Habitat Requirements for Feather River Fish Species (DWR 2004i and DWR 2004j).

To put this discussion of short-term warmer water temperature exposure in context for the WQC, it should be noted that most Central Valley salmonid supporting tributaries experience periods when water temperatures are above those temperatures reported as optimal. Many of those same tributaries, including Butte Creek as an example, have successful and sustainable populations of coldwater fisheries (Ward et al 2006).

Most LFC and HFC water temperature exceedances of optimal water temperatures for coldwater fisheries are driven by transient diurnal events as evidenced by this recent temperature profile from Robinson Riffle in July, 2010 (DWR 2010). Figure 1.2-1 Feather River at Mile 61.6, demonstrates that water temperatures naturally vary significantly (5°F day vs. night on the same day in this example data).



**Figure 1.2-1 Feather River at Mile 61.6**

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DWR relicensing studies, FEIR impact analysis, and the Oroville Dam Draft BiOp (NMFS 2009) focused on the evaluation of the suitability of conditions for salmonids and the potential effects on each life stage that occurs in the lower Feather River.

The following discussion describes the findings of those documents for each of the coldwater fisheries life stages that occur in the Feather River:

**A. Salmonid Juvenile Rearing**

The data provided during the relicensing process indicated that the existing condition requirement for a 65°F daily mean at Robinson Riffle was not only adequate to protect juvenile salmonids utilizing the LFC but probably represented optimal conditions. The study on the growth of wild steelhead in 2003 showed that growth was much higher (roughly .8 mm/day greater) for wild steelhead rearing in one of the lower portions of the LFC (Steep Riffle, river mile 61), a full 0.5 miles downstream of the Robinson Riffle water temperature compliance point (DWR 2004f, page 5-8, Figure 5.3-1). The same study of hatchery steelhead placed in enclosures also showed no difference in growth rate between fish reared at Hatchery Riffle (near the FRFH) and fish reared at Eye Riffle (river mile 60.1), a full 1.5 miles below the Robinson Riffle compliance point (DWR 2004f, page 5-1, Table 5.1.1-1 and Figure 5.1.1-1). Furthermore, Myrick and Cech (2000) reported that "wild and hatchery Feather R. steelhead used in this study preferred temperatures between 17° and 20°C, suggesting that steelhead populations in California's Central Valley prefer higher temperatures than those from more northern latitudes" (Myrick and Cech 2000; page 7, paragraph 2). They also report that "Juvenile Feather R. hatchery steelhead food consumption and growth rates responded more to ration level than to thermal regime. Ration level is more important than thermal regime for juvenile Feather R. hatchery steelhead" (Myrick and Cech, 2000; page 6, paragraph 4). DWR snorkel, screw trap, beach seining, snorkeling and electrofishing surveys (Seesholtz et al 2004, DWR 2002b, DWR 2007b, DWR 2004b) also showed that juvenile steelhead greater than 100 mm regularly utilize the lowest portions of the LFC during the summer months (DWR 2004b, page 3-2, Figure 3.1-1; page 3-6, paragraph 1), presumably due to the abundance of food resources, cover rich habitat and optimal growing conditions that would give them an advantage over slower growing cohorts (DWR 2004b, pages 4-5, paragraph 4). Every study directly performed in the LFC or using steelhead collected from the LFC has shown the optimal rearing temperature for juvenile steelhead near 65°F daily mean (DWR 2004f, DWR 2004b, Myrick and Cech 2000).

**B. Salmonid juvenile emigration**

Between emergence and juvenile emigration, initial rearing tends to be very short in duration in the Feather River and averages several days to three weeks (DWR 2002b, DWR 2007a, DWR 2009 and DWR 2009a). Initial rearing has warmer water

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temperature requirements (60-65°F) than spawning and egg incubation (56°F) (DWR 2004h – Matrix of Fish Life History and Habitat Requirements). Since these life stages occur mostly concurrently and water temperatures are managed to protect the more sensitive spawning and egg incubation life stage, the conditions are more than protected for the juvenile emigration water temperature beneficial uses.

Migration through the HFC takes several days to a few weeks for an actively emigrating fish (DWR 2002b, DWR 2007b, DWR 2009a and DWR 2009b; page 16, paragraph 2). Water temperatures are designed for chronic long term exposure tolerances, not transient exposures (DWR, 2004h and DWR 2004i). Water temperatures downstream of the southern FERC boundary during the juvenile emigration period are warmer than the upper HFC and represent the majority of the water temperature exposure for this life stage, so making the HFC colder for juvenile emigration would not materially improve the level of protection for this Cold Freshwater Habitat beneficial use for this life stage.

**C. Salmonid adult immigration**

Relicensing Study Report F10 Task 1E (DWR 2005b), Adult Chinook Salmon Migration and Holding Patterns, evaluates adult salmonid immigration through the HFC and LFC and determined that it takes just a few days to a week for an actively immigrating fish to pass from the FERC boundary as far up as the Feather River Fish Barrier Dam and Feather River Fish Hatchery. Additionally, spring-run Chinook marked in recent acoustic and radio tagging studies reveal that travel time from Sunset Pumps at River Mile 38 to the Thermalito Afterbay Outlet (river mile 59) is generally a few days or less, further demonstrating that the potential duration of exposure to water temperatures above those considered optimal does not meet the definition of chronic exposure. Target water temperatures utilized in the study reports, the DEIR impact analyses, and established as targets in the Settlement Agreement Article A108 for the adult immigration life stage period were designed for chronic long term exposure tolerances, not transient exposures of a few hours or days (DWR 2004h and DWR 2004i– Matrix of Fish Life History and Habitat Requirements). Water temperatures warmer than reported as optimal for adult immigration can and sometimes do occur in the HFC and lower portions of the LFC for short periods of time. However, water temperatures downstream of the southern FERC boundary during the adult immigration period are typically warmer than the HFC and represent the majority (greater than 75 percent) of the water temperature exposure duration for this life stage, so making the HFC colder for adult immigration would not materially improve the level of protection for this Cold beneficial use life stage.

**D. Spring-run Chinook salmon holding**

The majority of HFC spring-run Chinook salmon holding (DWR 2005b) occurs at the Thermalito Afterbay Outlet pool. Most other documented spring-run Chinook salmon

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holding occurs in the LFC where water temperatures are in the optimal range in most of the reach most of the time. Radio tagging (DWR 2005b) indicates that most fish in the LFC hold in the upper mile of the LFC below the Fish Barrier Dam and the Feather River Fish Hatchery. Radio tag fish telemetry data in the F10 Task 1E (DWR 2005b) report suggests that some fish that hold in the HFC tend to immigrate all the way up to the fish barrier dam (and Feather River Fish Hatchery) and then seek where they will hold. Sometimes these fish volitionally go back downstream to warmer water temperatures and hold in the Thermalito Afterbay Outlet pool. The fact that large numbers of fish do hold at the Thermalito Afterbay Outlet pool (at the upstream end of the HFC) when unimpeded access to the LFC is available, is evidence that the conditions are suitable during the adult holding period in the summer. Early season pre-spawning "carcass" surveys have found very few spring-run Chinook salmon mortalities in the LFC or HFC in several years' of observation (DWR 2004a, DWR 2005a, DWR 2006a, DWR 2007a, DWR 2008 and DWR 2009c). There is absolutely no evidence that summer temperatures in the HFC cause pre-spawning mortality or impact egg viability or production in spring-run or fall-run Chinook beyond expected levels for adult immigration, and is similar or less than that experienced in other Central Valley streams (DWR 2004a, DWR 2005a, DWR 2006a, DWR 2007a, DWR 2008 and DWR 2009c and Ward et al 2007). Further evidence is the long-term and recently re-opened sport harvest fishery for Chinook salmon in the lower Feather River. The long term operation and recent continuation (2010) of this fishery by DFG (except in 2008 and 2009 during the "salmon collapse") illustrates the lack of concern on the part of DFG that elevated water temperatures in the HFC, combined with angling pressure, could have an adverse impact on survival or pre-spawning mortality. DFG agreed to the terms of the Settlement Agreement, which acknowledges that the Settlement Agreement package was protective of the harvest and sport fishing beneficial use.

**E. Chinook salmon spawning and egg incubation**

Various relicensing study reports and other research (DWR 2004e, DWR 2004j, DWR 2004k and Kindopp 1999) evaluate Chinook salmon spawning and egg incubation in the lower Feather River. Steelhead spawning and egg incubation is not discussed here as this species life stage occurs in the winter when water temperatures are not a factor in the suitability of habitat or in the level of protection under the existing conditions. Pre-spawn mortality rates are lower for the HFC (25% in 2003, 13% in 2004, 9% in 2005, 40% in 2006, 15% in 2007, 4% in 2008 and 7% in 2009) than the LFC, and are generally quite low (DWR 2002a, DWR 2003a, DWR 2004a, DWR 2005a, DWR 2006a, DWR 2007a, DWR 2008 and DWR 2009c). The combination of no angling pressure along with overall low escapement in 2008 and 2009 indicates that the pre-spawn mortality rate observed in the lower Feather River over the past 10 years is probably due as much to angling pressure and density dependent effects than water temperature or any other variable (2009c, page 3, paragraph 3).

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In addition to the PDEA and EIR findings that the existing conditions are protective of Cold beneficial uses, the recent NMFS Draft Biological Opinion for Oroville Dam (NMFS 2009) further supports this point. In its July 2009 transmittal letter to FERC, NMFS states, "Based upon the best available scientific and commercial information, the draft Biological Opinion and Conference Opinion concludes that the action is not likely to jeopardize Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley steelhead and the Southern DPS of North American green sturgeon or adversely modify designated or proposed critical habitat" (NMFS 2009b, page 1, paragraph 2).

It is very telling that, unlike the Board, NMFS did not choose to materially modify the terms of the Settlement Agreement, especially with regard to temperatures for salmonids. In its transmittal letter NMFS states, "NMFS believes that the draft Biological and Conference Opinion is consistent with Settlement Agreement for the Licensing of the Oroville Facilities (March 2006). The terms and conditions include some elements that were not specifically described in the proposed action, including the license articles proposed with the Settlement Agreement. However, the terms are drafted to be consistent with and not impede implementation of the license articles proposed with the Settlement Agreement." With regard to the additional protective measures for the Southern distinct population segment (DPS) of North American green sturgeon, NMFS notes that the species was listed after the Settlement Agreement was entered into, and that "NMFS coordinated with the California Department of Water Resources to develop terms and conditions that are consistent with the Settlement Agreement and that involved *only minor changes to the proposed action*" (emphasis added).

The Draft BiOp (NMFS 2009) states that "take" would occur "in the form of injury and death to adult Central Valley spring-run Chinook salmon from increased susceptibility to disease, pre-spawning mortality, reduced fecundity, and reduced reproductive success from exposure to water temperatures greater than 64°F in the LFC in July and August in 5 percent of years (expected to be dry or critically dry years), for 10 years, or until long-term operational or facility modifications are in place" (NMFS 2009 page 261). NMFS defines "take" as "to harass, *harm* (emphasis added), pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct." "Harm" is further defined by NMFS as "an act which kills or *injures* (emphasis added) fish or wildlife. Such an act may include significant habitat modification or *degradation* (emphasis added) where it actually kills or *injures* (emphasis added) fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding or sheltering" (NMFS 2009, page 259). Emphasis was added to specific elements of the NMFS definition of "take" to demonstrate to the Board that the NMFS definition of take is inclusive of the definition of "protect" that the Board uses for Cold beneficial uses. Since the Oroville project currently meets the water temperature requirements to avoid "take" as defined by the NMFS Biological Opinion and since the

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NMFS definition of take is inclusive of the definition used by the Board for protection of Cold beneficial uses, then the current conditions in the lower Feather River do protect Cold beneficial uses.

In analyzing the effects of the proposed action, NMFS looked at the best available scientific and commercial information relating to the status of the species and critical habitat and the effects of the action (NMFS 2009, p.2). NMFS assessed all of the conditions that would result from the proposed project, in combination with the conditions caused by past and ongoing activities and natural phenomena, and then evaluated how the proposed project's effects on riverine characteristics may affect the growth, survival, and reproductive success of individual fish (NMFS 2009, pages 6-7). It is of critical importance to note that in its analysis, NMFS reviewed an extremely comprehensive list of evidence and information. The BiOp states that "The primary source of initial information was the Oroville Facilities BA, produced for this consultation, FERC's Final Environmental Impact Statement for the Oroville Facilities and an extensive compilation of fishery, geomorphic, engineering, and operations study plan reports that were prepared during the study period for the license proceeding. Included within the Oroville Facilities BA was an extensive bibliography that served as a valuable resource for identifying key unpublished reports available from state and Federal agencies, as well as private consulting firms. It also provided a robust set of key background papers and reports in the published literature on which to base further literature searches" (NMFS 2009, pages 14-15).

In the draft BiOp, NMFS analyzed the many stressors that affect the species covered in the opinion, and looked at the viability of the species. With regard to spring-run Chinook salmon, on page 139 of the BiOp, NMFS states "Current stressors to Central Valley spring-run Chinook salmon populations within the Feather River include: (1) loss of most historic spawning habitat from dams blocking access to habitat historically used by Feather River spring-run Chinook salmon; (2) degradation of remaining habitat related to water development; (3) genetic threats from the FRFH spring-run Chinook salmon program and hybridization between naturally spawning spring- and fall-run Chinook salmon; and (4) limited amount of existing spawning habitat below the Fish Barrier Dam." In its discussion of the likelihood of viability of spring-run Chinook salmon in the action area, NMFS states "The viability of CV spring-run Chinook salmon has been reduced due to habitat loss, 40 years of hatchery operations, and hybridization with the fall-run Chinook salmon" (NMFS 2009, page 148).

With regard to Central Valley steelhead, NMFS analyzed the factors affecting both spring-run Chinook salmon and Central Valley steelhead because many of the factors are common to both species (NMFS 2009, pages 139-148). These factors include minimum instream flows, ramping rates, and water temperature requirements in the Feather River below Oroville Dam, water quality, instream habitat availability, hatchery operations, and straying and genetic introgression. In its discussion of the likelihood of

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viability of Central Valley steelhead in the action area, NMFS states "The viability of CV steelhead has been reduced due to habitat loss and 40 years of hatchery operations resulting in a loss of genetic diversity and fitness... The viability of this population will remain dependent upon the hatchery until the HGMP is fully implemented, and additional spawning and rearing habitat are created in the LFC" (NMFS 2009, page 152.).

With regard to green sturgeon, NFMS analyzed all of the factors affecting the status of the species, including fish passage and habitat availability, flows, and water temperature. With regard to water temperature, NMFS found that "Currently, water temperatures in the Lower Feather River are capable of supporting green sturgeon spawning during much of the spawning period, including what is considered the peak spawning period in April and May" (NMFS 2009, page 157, paragraph 5). In its analysis of the likelihood of the continued existence for green sturgeon in the action area, NMFS states "There is uncertainty regarding the status of green sturgeon in the Feather River, but the limited available information shows that green sturgeon are present in the Feather River utilizing deep holes during the spawning period, and that this habitat contains pools of sufficient depth, velocity, and water temperature to support spawning, egg incubation, and early juvenile rearing. This information suggests that in spite of the habitat loss and exposure to a changed flow regime, suitable conditions exist in wet and above average water years, which are important water year types for green sturgeon reproduction and abundance, and that green sturgeon are likely to continue to exist in the Feather River" (NMFS 2009, pages 158-159.).

These species, Chinook salmon, Central Valley steelhead, and Sturgeon, are the same species that are meant to be protected under the Cold beneficial use in the Basin Plan. NMFS carefully analyzed all of the stressors on the species and listed which of those stressors affect the viability of the species, and found that the existing water temperatures in the Project area are not among them. This is in marked contrast to the emphasis that the Board has placed on temperature as a key factor in making its determination. On page 161 of the BiOp, NMFS analyzed the importance of the action area for not only the survival but also the recovery of the species, and stated "Sacramento River winter-run, Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley steelhead, and the southern DPS of North American green sturgeon are expected to continue to utilize the action area as a migratory corridor and for spawning and/or rearing... *The value of the lower Feather River Basin, within which the Oroville Facilities are located, as a migratory corridor, and its suitability for spawning and rearing habitat, make it an important node of habitat for the survival and recovery of local populations of these species.*" (emphasis added).

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**Section 1.3 – Cold beneficial uses will be enhanced under the Settlement Agreement**

While it is clear that the Cold beneficial uses are currently protected under the existing license conditions, the actions called for in the Settlement Agreement will substantially improve these conditions and will result in an increased level of protection of the Cold beneficial uses. The actions set forth the Settlement Agreement, including additional water temperature improvements, as well as improvements to the physical habitat components, such as the creation of new side channels, are just as important as improving water temperatures to increasing the level of protection of coldwater fisheries habitat and protection.

Settlement Agreement articles that restore, enhance and create physical habitat components for Cold beneficial uses in areas that already have optimal water temperatures in the LFC will result in increased habitat capacity in these areas. Increased quantity and quality of physical habitat components in these upstream areas will likely result in fish moving from downstream areas (that occasionally experience water temperatures that exceed the optimal condition) to upstream reaches. Creating additional habitat capacity in areas that already experience optimal water temperatures is equally as important and beneficial to protecting coldwater resources as reducing water temperatures in locations farther downstream.

The Final Environmental Impact Report (FEIR) and PDEA provide a complete analysis of the Settlement Agreement Proposed Project and articles. The Settlement Agreement proposed project is a combination of the PDEA proposed action and measures in the PDEA Alternative 2 that further enhance the habitat. A summary of the findings of the PDEA and EIR for each life stage of the coldwater fisheries species is provided below.

**A. Juvenile salmonid rearing habitat enhancement**

The PDEA G-AQUA4 and G-AQUA5 (DWR 2005d) and DEIR Appendix C3 and C4 (DWR 2007c and DWR 2007d) determined that implementation of the Proposed Action would result in beneficial impacts on juvenile salmonid rearing. Elements of the Proposed Project that contributed to the overall beneficial impact to juvenile salmonid rearing included gravel supplementation, channel improvement, structural habitat supplementation, riparian floodplain improvement, and flow and water temperature improvements. Following are brief descriptions of the types of benefits to this life stage for each of the relevant Settlement Agreement articles.

- Gravel supplementation (Settlement Agreement A102) results in increased food base quantity.

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- Channel Improvement Program (Settlement Agreement A103) results in improved quantity and quality of steelhead and Chinook salmon juvenile rearing habitat (mostly in the LFC).
  - Increased shallow edge cover refuge from predators
  - Improved water temperatures from increased riparian shade component
  - Increased food base quantity and diversity
- Structural Habitat Supplementation and Improvement Program (Settlement Agreement A104) results in improved quantity and quality of juvenile rearing habitat in LFC and HFC. LFC habitat quality will benefit more from Large Woody Debris (LWD) supplementation than the HFC because the HFC already has more LWD than the LFC.
  - Increased habitat diversity
  - Increased cover from predators
  - Increased velocity diversity
- Riparian Floodplain Improvement Program (Settlement Agreement A106) results in improved quantity and quality of juvenile rearing habitat (Sommer et al 2001, page 325, paragraph 1; page 331, paragraph 3).
  - Increased food base quantity and diversity
  - Increased growth rates
  - Increased survival rates from improved avoidance of predators
- Flow and Temperature Improvements (Settlement Agreement A108) results in an increase in the quantity and quality of juvenile salmonid rearing habitat.
  - Increases in LFC minimum flows to 700 cfs during the juvenile rearing period increases the quantity of available juvenile rearing habitat in the LFC (Phase 2 Report, Evaluation of Project Effects on Instream Flows and Fish Habitat, SP-F16 (DWR 4004I))
  - Decreases in water temperatures at Robinson Riffle (Settlement Agreement Table 1) during the juvenile rearing period improves the quality of juvenile rearing habitat in the LFC and HFC
  - Increases in LFC minimum flows results in cooler water temperatures reaching farther downstream, increasing the quality of juvenile rearing habitat

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- Increases in LFC minimum flows results in a reduced proportional flow contribution from the Thermalito Afterbay outlet for the HFC flows which results in cooler water temperatures reaching farther downstream which improves the quality of HFC juvenile rearing habitat

**B. Juvenile salmonid emigration habitat enhancement**

The PDEA G-AQUA4 and G-AQUA5 (DWR 2005d) and DEIR Appendix C3 and C4 (DWR 2007c and DWR 2007d) determined that implementation of the Proposed Action would result in beneficial impacts on juvenile emigration. Habitat requirements of juvenile salmonid emigration are very similar to those for juvenile salmonid rearing, so many of the Proposed Action benefits are the same. Elements of the Proposed Project Action that contributed to the overall beneficial impact to juvenile emigration included channel improvement, structural habitat supplementation, riparian floodplain improvement, and flow and water temperature improvements. Following are brief descriptions of the types of benefits to this life stage for each of the relevant Settlement Agreement articles.

- Gravel supplementation (Settlement Agreement A102) results in increased food base quantity.
- Channel Improvement Program (Settlement Agreement A103) results in improved quantity and quality of juvenile emigration habitat (mostly in the LFC).
  - Increased shallow edge cover refuge from predators
  - Improved water temperatures from increased riparian shade component
  - Increased food base quantity and diversity
- Structural Habitat Supplementation and Improvement Program (Settlement Agreement A104) results in improved quantity and quality of juvenile emigration habitat in LFC and HFC. LFC habitat quality will benefit more from Large Woody Debris (LWD) supplementation than the HFC because the HFC already has more LWD than the LFC.
  - Increased habitat diversity
  - Increased cover from predators
  - Increased velocity diversity
- Riparian Floodplain Improvement Program (Settlement Agreement A106) results in improved quantity and quality of juvenile emigration habitat (Sommer et al 2001, page 325, paragraph 1; page 331, paragraph 3).

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- Increased food base quantity and diversity
- Increased growth rates
- Increased survival rates from improved avoidance of predators
- Flow and Temperature Improvements (Settlement Agreement A108) results in an increase in the quantity and quality of juvenile emigration habitat.
  - Increases in LFC minimum flows to 700 cfs during the juvenile emigration period increases the quantity of available juvenile emigration habitat in the LFC (Phase 2 Report, Evaluation of Project Effects on Instream Flows and Fish Habitat, SP-F16 (DWR 4004m))
  - Decreases in water temperatures at Robinson Riffle (Settlement Agreement A108.1, Table 1) during the juvenile emigration period improves the quality of juvenile rearing habitat in the LFC and HFC
  - Increases in LFC minimum flows results in cooler water temperatures reaching farther downstream, increasing the quality of juvenile emigration habitat
  - Increases in LFC minimum flows results in a reduced proportional flow contribution from the Thermalito Afterbay outlet for the HFC flows which results in cooler water temperatures reaching farther downstream which improves the quality of HFC juvenile emigration habitat

**C. Adult immigration and holding habitat enhancement**

The PDEA G-AQUA4 and G-AQUA5 (DWR 2005d) and DEIR Appendix C3 and C4 (DWR 2007c and DWR 2007d) determined that implementation of the Proposed Action would result in beneficial impacts on adult immigration and holding. Elements of the Proposed Project Action that contributed to the overall beneficial impact to adult immigration and holding included channel improvement, structural habitat supplementation, fish segregation weir and flow and water temperature improvements. Following are brief descriptions of the types of benefits to this life stage for each of the relevant Settlement Agreement articles.

- Channel Improvement Program (Settlement Agreement A103) results in improved quantity and quality of adult immigration and holding habitat (mostly in the LFC).
  - Increased shallow edge cover refuge from predators
  - Improved water temperatures from increased riparian shade component
  - Increased food base quantity and diversity

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- Structural Habitat Supplementation and Improvement Program (Settlement Agreement A104) results in improved quantity and quality of adult immigration and holding habitat in LFC and HFC. LFC habitat quality will benefit more from Large Woody Debris (LWD) supplementation than the HFC because the HFC already has more LWD than the LFC.
  - Increased habitat diversity
  - Increased cover from predators
  - Increased velocity diversity
- Fish Weir (Settlement Agreement A105) will segregate spring-run Chinook salmon and keep them from going up to Feather River Fish Hatchery and Fish Barrier Dam and then going back downstream to hold in the Thermalito Afterbay Outlet pool (DWR 2005b - SP-F10 1E).
  - Reduced exposure to fishing take and catch and release stress-related contributions to pre-spawn mortality rates
  - Improved thermal exposure conditions from segregation of spring-run in the upstream reaches of the LFC and the resulting stress-related contributions to pre-spawn and in-vivo egg mortality rates
- Flow and Temperature Improvements (Settlement Agreement A108) results in an increase in the quantity and quality of adult immigration and holding habitat.
  - Increases in LFC minimum flows to 700cfs during the adult immigration and holding period increases the quantity of available adult immigration and holding habitat (Phase 2 Report, Evaluation of Project Effects on Instream Flows and Fish Habitat, SP-F16 (DWR 2004I) and Evaluation of Oroville Facilities Operations on Water Temperature Related Effects on Pre-Spawning Adult Chinook Salmon and Characterization of Holding Habitat (DWR 2004d)
  - Increases in LFC flows results in cooler water temperatures reaching farther downstream, increasing the quality of adult immigration and holding habitat
  - Increases in LFC minimum flows results in a reduced proportional flow contribution from the Thermalito Afterbay outlet for the HFC flows which results in cooler water temperatures reaching farther downstream which improves the quality of adult immigration and holding habitat
  - Decreases in water temperatures at Robinson Riffle during the adult immigration and holding period improves the quality of adult immigration and holding habitat in the LFC and HFC (Settlement Agreement A108.1, Table 1)

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**D. Salmonid spawning and egg incubation habitat enhancement**

The PDEA G-AQUA4 and G-AQUA5 (DWR 2005d) and DEIR Appendix C3 and C4 (DWR 2007c and DWR 2007d) determined that implementation of the Proposed Action would result in beneficial impacts on spawning and egg incubation. Elements of the Proposed Project Action that contributed to the overall beneficial impact to spawning and egg incubation included gravel supplementation, channel improvement, structural habitat supplementation, fish segregation weir and flow and water temperature improvements. Following are brief descriptions of the types of benefits to this life stage for each of the relevant Settlement Agreement articles.

- Gravel supplementation (Settlement Agreement A102 and B105) results in improved quantity and quality of spawning and egg incubation habitat in the LFC in turn results in:
  - Reduced competition for spawning habitat and its contribution to pre-spawn mortality rates
  - Reduced redd superimposition resulting in increased egg and alevin survival
  - Reduced stress related to marginally suitable spawning substrate and its contribution to pre-spawn and in-vivo egg mortality rates
  - Reduced proportion of the Chinook salmon population that would be anticipated to utilize habitat in the HFC, which in turn results in:
    - Reduced exposure to elevated water temperatures in the HFC and its contribution to pre-spawn mortality rates, in-vivo egg mortality and egg and alevin mortality rates
    - Reduced exposure to fishing take and catch and release stress-related pre-spawn mortality
- Channel Improvement Program (Settlement Agreement A103) results in improved quantity and quality of spawning and egg incubation habitat (mostly for steelhead in the in LFC).
  - Improved quantity of smaller tributary/side channel spawning habitat preferred by steelhead
  - Improved quality of spawning substrate and increased gravel recruitment
  - Improved spawning and egg incubation water temperatures from increased riparian shade component

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- Structural Habitat Supplementation and Improvement Program (Settlement Agreement A104) results in improved quantity and quality of spawning and egg incubation habitat in the LFC and HFC. LFC habitat quality will benefit more from Large Woody Debris (LWD) supplementation than the HFC because the HFC already has more LWD than the LFC.
  - Increased habitat diversity
  - Increased cover from predators and from disturbance during spawning
  - Increased velocity diversity
- Fish Weir (Settlement Agreement A105) results in improved quantity and quality of spawning and egg incubation habitat for spring-run Chinook salmon and steelhead by spatially segregating them keep them from the fall-run Chinook salmon.
  - Reduced rate of spring-run Chinook salmon genetic introgression with fall-run Chinook salmon
  - Reduced competition for spawning habitat resulting in a reduction of stress contributing to pre-spawn and in-vivo egg mortality rates
  - Reduced exposure to fishing take and catch and release stress-related contributions to pre-spawn mortality rates
  - Reduced redd superimposition resulting in increased egg and alevin survival rates (DWR 2005c - PDEA Chapter 5-5, page 5-7.19)
  - Improved spawning water temperatures in their upstream reserved habitat in comparison to the proportion of the population that previously would have spawned lower in the LFC or in the HFC which results in increased egg and alevin survival rates
- Flow and Temperature Improvements (Settlement Agreement A108) results in an increase in the quantity and quality of adult immigration and holding habitat.
  - Increases in LFC minimum flows to 700 cfs during the adult immigration and holding period increases the quantity of available adult immigration and holding habitat (DWR 2004m - Phase 2 Report, Evaluation of Project Effects on Instream Flows and Fish Habitat, SP-F16; and Final Report, Evaluation of Oroville Facilities Operations on Water Temperature Related Effects on Pre-Spawning Adult Chinook Salmon and Characterization of Holding Habitat, SP-F10 Tasks 1D and 1E (DWR 2004d)
  - Increases in LFC flows results in cooler water temperatures reaching farther downstream, increasing the quality of adult immigration and holding habitat

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- Increases in LFC minimum flows results in a reduced proportional flow contribution from the Thermalito Afterbay Outlet for the HFC flows which results in cooler water temperatures reaching farther downstream which improves the quality of adult immigration and holding habitat
- Flow and Temperature Improvements (Settlement Agreement A108) results in an increase in the quantity and quality of salmonid spawning and egg incubation habitat “Flows in the LFC during the Chinook salmon spawning period would be 800 cfs under the Proposed Project which would result in almost 100 percent of maximum WUA, representing an increase in the quantity of available spawning habitat compared to the No-Project Alternative” (DWR 2007d - DEIR Appendix C4, page C4-14).
  - Increases in LFC minimum flows to 800 cfs during the salmonid spawning and egg incubation period increases the quantity of available salmonid spawning and egg incubation habitat (F16 Phase 2) which results in:
    - Reduced competition for habitat and its contribution to pre-spawn mortality rates
    - Reduced redd superimposition resulting in increased egg and alevin survival
  - Increases in LFC flows results in cooler water temperatures reaching farther downstream, increasing the quality of salmonid spawning and egg incubation habitat and increasing egg and alevin survival rates
  - Increases in LFC minimum flows results in a reduced proportional flow contribution from the Thermalito Afterbay Outlet for the HFC flows which results in cooler water temperatures reaching farther downstream which improves the HFC quality of salmonid spawning and egg incubation habitat, which in turn result in,
    - Reduced thermal stress contributions to pre-spawn and in-vivo egg mortality rates
    - Increased egg and alevin survival rates
  - Decreases in water temperatures at Robinson Riffle (Settlement Agreement A108.1, Table 1) during the salmonid spawning and egg incubation period improves the quality of salmonid spawning and egg incubation habitat in the LFC and HFC (DWR 2004j , DWR 2004k and DWR 2005c)
    - Reduced average daily water temperatures proposed in the Settlement Agreement (similar to those identified in the PDEA Alternative 2) result in increased overall habitat suitability for each water temperature index

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value for fall-run Chinook salmon adult spawning and embryo incubation (DWR 2005d - PDEA Page G-AQUA5-28).

- Reduced average daily water temperatures proposed in the Settlement Agreement (similar to those identified in the PDEA Alternative 2) result in increased overall habitat suitability for each water temperature index value for spring-run Chinook salmon adult spawning and embryo incubation (DWR 2005d - G-AQUA5-44).

The DEIR analyzed the Proposed Project (Settlement Agreement) for each component of Cold beneficial use as defined and designated in the Water Quality Control Plan for the Sacramento and San Joaquin River Basins, Fourth Edition, September 1998, as amended and found that each beneficial use would either be protected, or in many cases, enhanced. The DEIR states "The Proposed Project would have a substantial beneficial effect on coldwater habitat for Chinook salmon and steelhead in the lower Feather River" (DWR 2007e, DEIR page 5.2-23). The DEIR (DWR 2007e), page 5.2-25, states "Additional lower Feather River coldwater fisheries habitat improvements include a Gravel Supplementation and Improvement Program (Settlement Agreement Article A102), a Channel Improvement Program (Settlement Agreement Article A103), a Structural Habitat Supplementation and Improvement Program (Settlement Agreement Article A104), a Riparian and Floodplain Improvement Program (Settlement Agreement Article A106), and a Feather River Fish Hatchery Improvement Program (Settlement Agreement Article A107)." The Board did make comments on the DEIR and those comments were addressed in the FEIR. Many of the same comments the Board made on the DEIR were reiterated in the draft WQC and in its letter dated July 9, 2010 to DWR. Those comments are addressed throughout this response document. It should be noted that in the Board's comments on the DEIR it did not directly refute the conclusion that the Proposed Project results in the protection Cold beneficial uses.

In addition to the PDEA and DEIR findings, the Settlement Agreement Explanatory Statement (DWR 2006d, page 28, paragraph 3) includes the following statement, "During the study plan process water temperatures in the Low Flow Channel and High Flow Channel were identified as potential contributing stressors for anadromous salmonids (F10 Task 1D, F10 Task 2C, F10 Task 3B and F10 Task 4B). Operation of the Oroville Facilities to meet the water temperature objectives identified in the Settlement Agreement would lower water temperatures in the LFC improving the quality and increasing the quantity of available coldwater fisheries habitat in the lower Feather River."

In summary, each life stage of coldwater fisheries that occur in the lower Feather River was found to benefit from the implementation of the Settlement Agreement. As demonstrated by the list of benefits above, much of the benefit derived from the Settlement Agreement is not just from water temperature improvements but also from and in combination with substantial physical coldwater fishery habitat improvements.

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**Section 1.4 – Summary**

In Section 1.1 above, DWR addressed the mischaracterizations of the lower Feather River Coldwater fishery, specifically the use of out-of-date references and the misconceptions regarding the level of current protections of Cold beneficial uses that were included in the WQC and other Board correspondence. DWR respectfully requests that the WQC be revised to correct the previous misconceptions of the conditions in the lower Feather River so that the conditions set forth in the WQC are based on current fact and the best available science.

DWR addressed the WQC assertion that some beneficial uses are not protected under the existing conditions in Section 1.2 above. In Section 1.2, DWR demonstrated conclusively that Cold beneficial uses are protected under the existing conditions. This conclusion is also supported by NMFS, which is the federal agency charged with the protection of the coldwater species, and undeniably has the most expertise with regard to the needs of the species and their habitat. NMFS' draft BiOp found that the water temperatures in the lower Feather River are not adversely impacting the species. Moreover, NMFS found that the lower Feather River is and will continue to be an important node of habitat for not only the survival, but the recovery, of the species.

As discussed at length above, the current operating conditions at the Oroville Facilities successfully protect Cold beneficial uses under the existing conditions. Further, the evidence presented by the Board to the contrary has been refuted not only by DWR, but by NMFS. All of the evidence before the Board shows that the beneficial uses are being protected under current conditions, and demonstrates that the Settlement Agreement will provide a greater level of protection and enhancement of the beneficial uses and they will only be improved upon as a result of the implementation of the terms of the Settlement Agreement. DWR respectfully requests that the Board not modify the temperature improvement actions contained in the Settlement Agreement, and instead incorporate them in their entirety in the draft WQC, which will result in a more defensible, more enforceable and more broadly supported set of conditions.

**Section 2 – Draft WQC Condition S8 water temperature requirement and compliance schedule is unreasonable and will be detrimental to the Cold Beneficial Uses**

The draft WQC S8 Conditions (SWRCB 2010a) will result in unnecessary impacts to other beneficial uses, reduce the reliability of the protection of Cold beneficial uses, set a compliance standard that the existing facilities cannot be reasonably expected to be able to meet, and overall reduce the level of protection of Cold beneficial uses.

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**Section 2.1 – Draft WQC Condition S8 will adversely impact Cold beneficial uses and reduce the reliability of protection**

The draft WQC correctly notes that there are conflicts between beneficial use resources. The draft WQC, Appendix A, page 2, paragraph 4, states, "*Potential future facilities modifications to reduce water temperature may have an adverse impact on warmwater fisheries habitat quality in Thermalito Afterbay.*"

The objective of the draft WQC Condition S8 is to protect Cold beneficial uses. Unfortunately, the unintended consequence of Condition S8 compliance requirements would lead to a reduction in the reliability of protection of Cold beneficial uses. As will be explained below, the draft WQC conditions for a water temperature requirement at Robinson Riffle and objectives at the southern FERC boundary would result in a loss in the operational flexibility to conserve coldwater resources in order to meet fishery needs in the fall.

Draft WQC Condition S8 requires the Project to apply all water temperature management actions to avoid water temperature exceedances to prove to the satisfaction of the Board's Deputy Director that the facilities are not able to comply with the Table S8 water temperature requirements. Draft WQC Condition S8 unnecessarily modifies the Robinson Riffle water temperature targets from the Settlement Agreement into requirements in the draft WQC. The inflexibility of the draft WQC S8 Condition may be detrimental to the protection of Cold beneficial uses. For example, during a period of low reservoir storage which may not be so extreme as to be covered by the conference year exception, the limited coldwater pool resources should be conserved in the spring and summer in order to ensure that adequate coldwater pool resources are available to meet the critical fall coldwater spawning fisheries water temperature needs.

The draft WQC Condition S8 requirement that DWR must affirmatively meet specified water temperatures until all water temperature management actions have been taken could lead to a situation where all coldwater resources have been depleted prior to the end of the water temperature management season in the late fall. DWR is very concerned that a temperature requirement that forces operations to expend the bulk of the accessible coldwater pool in the summer could result in significant harm to spawning Chinook in the fall, something that the Project has always managed to avoid by having operational flexibility and proactively coordinating with the fisheries agencies. An example of the hazards of running out of available coldwater pool and loss of water temperature control prior to the end of the Chinook salmon spawning season is found in the lower American River.

As reported on Bratovich, et al (2004; page 4, paragraph 3), "In many years, careful and efficient use of the temperature control devices at Folsom Reservoir (at the penstock inlet port and at the intake for local municipal supply) still results in less than desirable

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water temperature conditions in the lower American River for juvenile steelhead over summer rearing, and fall-run Chinook salmon spawning.”

The report further states, “Because the coldwater pool was low in 2001, the flexibility of coldwater management may have been diminished during portions of the periods of fall-run Chinook salmon adult immigration (i.e., September through December) and fall-run Chinook salmon adult spawning and embryo incubation (i.e., October through March) (SWRI 2001). In November 2001, the average daily water temperature at Watt Avenue in the lower American River was 61°F (DWR). Pronounced pre-spawning adult mortality as well as increased latent mortality to incubating embryos reportedly can result when ripe adult female Chinook salmon are exposed to water temperatures beyond the 56°F to 60°F range (McCullough 1999). Pre-spawning mortality of fall-run Chinook salmon was reported by DFG to be approximately 67 percent during the 2001 adult immigration and adult spawning season, presumably because of high water temperatures (Bratovich, et al 2004; page 7, paragraph 1).”

Water 4 Fish (2010) reports on the lower American River that, “In 2001, 87,600 Chinook salmon, 67% of the run, died before they could spawn. 35,400 died in 2002 and 58,600 died in 2003. River advocates and fishery biologists blamed these fish kills on bad water management by the Bureau of Reclamation and on the lack of flow and temperature controls for water released from Folsom Reservoir.”

The draft WQC condition requirement for water temperature compliance under all conditions (except a Conference Year) until no water temperature management actions remain could result in a situation where the Project is unable to protect the Cold beneficial use in the fall, resulting in a reduction in the level of protection as compared to the flexibility of and level of protection provided by the Settlement Agreement water temperatures operated as targets rather than compliance requirements. The draft WQC Condition S8 changes the Settlement Agreement water temperature targets into water temperature compliance requirements is unnecessary as Condition S8 Response Sections 1.2 and 1.3 demonstrate that the Cold beneficial uses are protected under the existing condition and are enhanced under the Settlement Agreement. The requirement for the Project to utilize all feasible water temperature management actions in the case of a water temperature exceedance to avoid a violation could result in the exhaustion of the limited coldwater resources for the Project to manage Cold beneficial uses. This would lead to a situation where the level of protection of Cold beneficial uses is reduced by introducing the risk of potential fish mortality or reduced spawning success during the Chinook salmon spawning season.

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**Section 2.2.1 – Under the Settlement Agreement, the existing facilities already maximize the use of limited coldwater pool resources**

The existing facilities have limited access to reservoir coldwater pool. Access to Lake Oroville's limited coldwater pool is nearly fully expended in many years under the existing conditions.

The Settlement Agreement provides for more efficient use of limited coldwater pool resources through the change in the sequence of temperature control actions as compared to the existing conditions (DWR 2005a) and the addition of water temperature management releases from the Fish Barrier Dam of up to 1500 cfs for Robinson Riffle (Settlement Agreement Table 1) and for southern FERC boundary water temperature management. The modified operations required by the Settlement Agreement would utilize the coldwater pool more efficiently than under the current license conditions, while the water temperature targets under the Settlement Agreement for Robinson Riffle would allow the Project to maximize the Cold beneficial uses and enhance the level of protection of Cold beneficial use as compared to the existing condition.

**Section 2.2.2 – Condition S8 increases the risk of loss of water temperature management control**

The requirement to meet the draft WQC S8 temperatures set forth in Table S8 would increase the frequency of the depletion of the accessible coldwater pool, posing an unreasonable and unacceptable risk to the Cold beneficial use at the end of the temperature management season, which typically ends in October, and in some years as late as November. If the accessible coldwater pool is depleted prior to the end of the water temperature management season, the facility would lose the ability to manage downstream water temperatures for the Feather River Fish Hatchery as well as for the lower Feather River. The resulting inability to meet temperature requirements during the latter part of the water temperature management season could lead to loss of protection of Cold beneficial uses and significantly reduced spawning success (see Section 2.1 above).

**Section 2.2.3 – The existing facilities cannot meet the Table S8 water temperature requirements under all conditions**

There are some conditions (primarily related to storage volume and climatic conditions) that occur where the existing facilities cannot comply with the draft WQC Table S8 Robinson Riffle water temperature requirements. Therefore, it is not reasonable to expect the existing facilities to reliably and sustainably meet the draft WQC Table S8 water temperature requirements. Attempting to comply with a requirement more stringent than existing facilities and the limited coldwater pool resources are physically able to achieve could lead to reduced success in the protection of Cold beneficial uses.

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DWR also conducted an analysis to evaluate the Project's ability to meet the water temperature targets under the Settlement Agreement with and without the use of the river valve. The results of the analysis indicated that the loss of the river valve does not substantively alter the Project's compliance performance with the draft WQC Table S8 Condition or the Settlement Agreement requirements. However, because of the inherent error in the model tools great caution should be exercised when using the results as forecasted values (see Section 2.2.6). Therefore, DWR insists on following the method spelled out in Settlement Agreement Article A108.1

**Section 2.2.4 – Draft WQC Condition S8 reduces the efficiency of limited coldwater pool resource use and results in a reduction in the level of protection of Cold beneficial uses**

The requirement to meet the Table S8 water temperatures and the need to prove that exceedances were due to limitations of the facilities to meet them will lead Project operators to operate more conservatively (with a management buffer below the requirement to make sure they do not exceed it) that will result in less efficient use of the limited available coldwater resources with little to no incremental benefit or level of Cold beneficial use protection. As a result of the necessarily more conservative water temperature management operations to avoid a violation of the draft WQC requirements, the coldwater pool will be expended in a manner that delivers overall lower enhancement to Cold beneficial uses and could potentially result in a substantial reduction in the reliability of the protection of the Cold beneficial uses. The Settlement Agreement water temperature compliance targets provide flexibility for managing water temperatures for this longer term exposure based standard and for more efficient use of limited reservoir coldwater pool resources. Increased coldwater pool use efficiency results in increased overall level of protection of Cold beneficial use and an increased reliability of that protection.

**Section 2.2.5 – Future water temperature standards should not be established using modeling without a new facilities testing period**

The draft WQC Condition S8 requires DWR to submit a report three years after the license issuance that will propose water temperature standards that will increase the level of Cold beneficial use protection. The S8 Condition requires that the Project will comply with this new standard within 10 years of license issuance at Robinson Riffle and the southern FERC boundary. In order for a new set of water temperature standards to be developed within the three year deadline, the new standards would have to be based on modeled water temperatures of operations of the proposed long term facilities modifications. Modeling tool limitations make them inappropriate and unreliable for development for future water temperature standards without a provision for those standards to be revised based upon testing of the new facilities.

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Oroville Facilities water temperature modeling is complex and is dependent upon two other models to provide input (estimated values) in order for the water temperature model to run. CALSIM II is used for system-wide Central Valley Project and State Water Project operations and it estimates water releases required from the Oroville Facilities on a monthly basis. In turn, HYDROPS takes the monthly release targets from CALSIM II and predicts what operations would occur on a 15 minute interval during the month to meet the CALSIM II monthly release requirements. Water Quality for River-Reservoir System (WQRRS), the water temperature modeling tool for the Oroville Facilities and lower Feather River, takes the HYDROPS operations and applies historical climatic conditions over a 72 year period of observed hydrology to estimate water temperatures and identify when water temperature management actions are needed to meet the water temperature compliance requirements for the Project. Each time the WQRRS identifies a need for a water temperature management action in order to stay in compliance with water temperature requirements, there is an iterative interaction with the HYDROPS operation modeling to reflect the operational change. A brief explanation of the complexities and limitations of these modeling tools is set forth below.

CALSIM II, HYDROPS and WQRRS are good planning tools, but include many simplifying assumptions that limit their use as a forecast models. These modeling tools provide relative output results which are appropriate for comparison purposes only. These types of comparisons between operational scenarios are made to determine the relative amount of change between the scenarios based on the changes in assumptions between the scenarios.

The "DEIR Appendix C Modeling Tools and Results" describes the limitations of CALSIM II. "CALSIM II is a planning tool designed for analysis of the long-term effects of facility or operational changes in the system. It has limited usefulness in the analysis of effects during specific years resulting from short-term trends or operational changes. Because it uses a constant level of development, a single simulation cannot be used for direct analysis of changes over time" (DWR 2005b).

The "DEIR Appendix C Modeling Tools and Results" describes the limitations of HYDROPS. "The local operations modeling was based on the results of the CALSIM II simulations; therefore, the results are subject to the accuracy of those simulations. The reasonableness of the local operations modeling was continually evaluated during the simulation process. The local operations model used a synthetic hydrologic flow sequence that contains the same volume of flows as CALSIM II on a monthly basis. The monthly hydrology used from the CALSIM II modeling was disaggregated into weekly or daily data using a process designed to preserve the monthly volumes while accounting for shorter term ramping restrictions not included in the monthly CALSIM II modeling. The resulting hydrology does not reproduce historical flood events" (DWR 2005a).

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Given the limitations of the water temperature modeling and related tools and the best available science, it is not reasonable for the draft WQC S8 Condition to require DWR to establish a future more protective water temperature compliance requirement in the 3 year report based on modeling without including a process for the modification of those standards based upon a “real world” testing period after facilities modifications have been completed. Given the limitations of the operations and water temperature models, as well as the best available science, DWR requests that the methodical and specific process defined in the Settlement Agreement Article A108 for developing revised and more protective future water temperature objectives be adopted as the WQC condition. The future water temperature objective development process set forth in Settlement Agreement Article A108 develops a provisional target based on modeling and, after the facilities modifications are completed, a five year testing period to revise and finalize the standard. This methodical and specific process set forth in the Settlement Agreement appropriately utilizes the modeling tools for planning and avoids the limitations of the modeling tools. Utilizing experience gained from a testing period of new facilities to revise target water temperature objectives before finalizing them into enforceable requirements is reasonable and prudent and provides an assurance that the facilities will be able to comply with the revised requirement. This assurance of the ability of the Project to comply with a WQC requirement is consistent with the Board’s definition of “reasonable” for establishing a standard. The Board provided their definition of reasonable in the letter to DWR dated July 9, 2010, page 4, paragraph 2, “Reasonable” in the regulation refers to the level of certainty the State Water Board must have that a Project will comply...” Without a testing period for the new facilities, the Board cannot achieve this reasonable level of certainty that the facilities can comply with the condition.

In addition to the limitations of the modeling for use in absolute temperature terms to develop a water temperature compliance standard, and the other inherent limitations of the modeling tools, the accuracy of the model should be expected to be reduced in the prediction of water temperatures under the facilities modification scenarios. The Oroville water temperature model was calibrated under the existing license conditions (DWR 2005b). The three year report water temperature modeling of facilities modifications would incorporate substantial anticipated changes in physical conditions and operations of the facilities that are outside of the conditions under which the operations and water temperature models were calibrated. The detailed design for the facilities modifications would not be completed until after the three year report and the subsequent environmental review process, see Figure 2.3-1. Although every effort will be made to develop high quality assumptions of the characteristics of the facilities modifications and operational changes for modeling the proposed facilities modifications in the three year report, the absolute accuracy of the prediction of water temperatures under these changed conditions would be expected to be less precise than current conditions estimates under which the model was calibrated. Predicting values outside

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of the calibration range of any model is uncertain at best and can lead to substantial increases to the potential error in the predicted outcome (water temperatures in this case).

As an example of the modeling complexities, any Afterbay-related facilities modifications would be particularly problematic to predict their operational and physical characteristics for the estimation of Thermalito Afterbay Outlet release water temperatures. Thermalito Afterbay constitutes the most hydrologically complex regime of all of the Oroville Facilities reservoirs (DWR 2001). Water temperature distribution and flow patterns in the Afterbay are complex and variable depending on conditions (e.g. wind) which make prediction of Thermalito Afterbay Outlet release water temperatures particularly challenging for water temperature modeling. Accurately predicting Thermalito Afterbay Outlet release water temperatures to the HFC would be integral to accurately predicting temperatures at the FERC boundary and to setting reliably achievable (reasonable) water temperature compliance objectives.

In conclusion, the use of modeling to develop future water temperature compliance objectives is not appropriate because modeling tools are appropriate for planning, but not absolute value water temperature prediction. Use of the water temperature model for prediction of absolute values under the existing conditions is an inappropriate use of these tools and it is even less reasonable to rely upon their accuracy for prediction of absolute water temperature values under changed assumptions and physical characteristics of facilities modifications for the three year report. A testing period long enough to experience a range of conditions (five years) is needed to establish revised water temperature objectives before there can be a reasonable certainty that the facilities can comply with a new water temperature objective for Robinson Riffle, but especially for the southern FERC boundary.

**Section 2.3 – Draft WQC Condition S8 timeline for implementation is unreasonable**

The draft WQC S8 Condition sets a timeline for additional levels of protection of Cold beneficial uses for 10 years after the license issuance, whether facilities modification are completed or not. The deadline for facilities modifications to be completed within 10 years after the license issuance is logistically infeasible.

DWR produced an "Explanatory Document" which provided documentation of the supporting rationale for the Settlement Agreement articles. One of the topics addressed in the document was the anticipated timeline for the facilities modifications. Figure 2.3-1 Oroville Facilities Flow and Temperature Timeline and Schedule (DWR 2006b) shows the anticipated schedule for the completion of the facilities modifications.



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and public reviews and environmental-related permitting. Based on the mandatory CEQA requirements and on DWR's experience with other projects of similar complexity, it is much more likely that the CEQA process will require three or more years. An additional 1.5 or more years will be required for permitting, final design and construction contracting. Construction contracting includes requests for quote preparation, advertising, contractor response development and submittal, contractor selection, contract negotiations, and mobilization of the selected contractor team. Figure 2.3-1 above indicates a 2 year period for construction. A time period of less than three years for construction and acceptance testing is probably not feasible to complete all facilities modification projects related to water temperature management. Reasons it is unlikely that the construction phase can be completed in 2 years include:

- Seasonal constraints on in-stream construction periods based on avoidance and minimization of in-stream construction affects on Endangered Species Act (ESA) listed species present in the LFR may allow in-stream construction for as few as 3 months (June through August) per year.
- Some combinations of facilities modifications may need to be constructed sequentially.
- Procurement of some specialized equipment may require more than a couple years. As an example, certain types of high pressure pumps and tunnel boring machines, both of which may be required for some of the alternative facilities modifications, currently take two to three years from order to delivery.
- Newly constructed facilities require a testing and acceptance period prior to full operation. The testing and acceptance period is reflected in Figure 2.3-1 in year 9 through year 10.

With the revised schedule assumptions of no delay between license issuance and acceptance, 3 plus years for CEQA, and 3 plus years for construction, the best case scenario for completion of facilities modifications and acceptance testing is 11.5 years. Previous discussions in Section 2.2.3 above demonstrate that it is not reasonable for the Board to expect that the Project to comply with additionally protective water temperature requirements prior to the completion of the facilities modifications. Therefore, the draft WQC condition to comply with more protective water temperature standards by year 10 after the license issuance is not reasonable.

**Section 2.3.1 – Draft WQC Condition S8 requirement to comply with more protective water temperature standards without new facilities testing is unreasonable**

The draft WQC Condition S8 requirements omit the Settlement Agreement Article A108 provision for five years of facilities modification testing prior to the adoption of final water

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temperature requirements for the southern FERC boundary. Section 2.2.6 above has already discussed the importance of testing new facilities and on not relying solely on water temperature modeling to establish water temperature compliance requirements. Testing of facilities modifications prior to adoption of final water temperature requirements is important for the Robinson Riffle water temperature standards, but is doubly important for the very operationally complex water temperature management required to meet an objective at the southern FERC boundary. Water temperature management in the HFC is complex and includes a number of complex variables that require testing in order to set reasonable and reliably achievable water temperature objectives and to minimize impacts on other beneficial use resources.

***Section 2.3.2 – Operations to manage water temperatures at the southern FERC boundary are complex and need testing prior to implementation of a compliance requirement***

There are limitations on HFC water temperature management based on time required to adjust Hyatt, Fish Barrier Dam and Thermalito Afterbay Outlet releases. DWR operational managers need to anticipate southern FERC boundary water temperature management needs and make operational decisions for water temperature management actions substantially in advance of potential water temperature exceedance events. Water temperature management actions for the southern FERC boundary need to be taken in advance according to the following approximate timeframes:

- 1) Four hours in advance to pull a power intake water temperature control stop log
- 2) Thirty hours in advance for water travel time from Hyatt releases to the southern FERC boundary
- 3) Five hours to implement flow changes at the Diversion Dam from the base flow of 800 cfs during the spawning season to the maximum water temperature management flow of 1500 cfs
- 4) Twelve hours in advance for water travel time from Fish Barrier Dam releases to the southern FERC boundary
- 5) One hour to implement flow changes at the Thermalito Afterbay Outlet to compensate for flow changes from the Fish Barrier Dam to maintain the same net flows to the LFR
- 6) Two hours in advance for water travel time from the Thermalito Afterbay Outlet releases to the southern FERC boundary

Some of the water temperature management logistics are additive in terms of lead time required to affect a water temperature change at the southern FERC boundary. As an

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example, pulling a stop log and water travel time of the resulting cooler release water from Hyatt to the southern FERC boundary may require a total of approximately 2 and a half days to affect a water temperature change at the southern FERC boundary.

As illustrated in the water temperature management logistics above, the water temperature management actions needed to comply with a water temperature requirement at the southern FERC boundary are very complex and require real world testing of facilities modifications under a range of conditions prior to the water temperature objective becoming a requirement. It is unreasonable for the WQC conditions to require compliance to a water temperature standard developed on modeling alone and not to include the Settlement Agreement provision for a five year testing period of facilities modifications.

Further, the Project operators would have to adopt overly conservative water temperature management practices to compensate for varying conditions and the inability to perfectly foresee conditions at the southern FERC boundary more than two and a half days in advance. Under the draft WQC S8 southern FERC boundary water temperature requirement with untested facilities, this necessarily conservative water temperature management practice will cause inefficient use of limited coldwater pool resources. As discussed at length above, the inefficient use of limited coldwater pool resources can potentially result in a reduction in the level of protection of the Cold beneficial uses, or worse in a failure to protect those resources in the event that coldwater pool resources are fully expended. The resulting risk of reductions in or failure of protection of Cold beneficial uses caused by draft WQC Condition S8 is not reasonable. Condition S8 should be revised to include a provision that the water temperature objective for Robinson Riffle and the southern FERC boundary included in the 3 year report are revised after the new facilities testing period. The additional protective standard should not become a requirement until the facilities modifications are completed and a 5 year testing period has been completed to ensure that operations can efficiently and reliably meet the new standard.

**Section 2.4 – Summary**

Draft WQC Condition S8 could cause unintended adverse impacts on Cold beneficial uses, see Section 2.1 above. The Settlement Agreement water temperature targets also provide the Project operators with greater flexibility to reduce the conflicts between other beneficial uses, including Water Contact and Non-Contact Water Recreation, Warm Freshwater Habitat and Agricultural Supply. For these reasons, DWR requests that the WQC S8 Condition adopt the Settlement Agreement Table 1 Water Temperature targets at Robinson Riffle.

The draft WQC Table S8 water temperature requirement reduces operational flexibility as compared to the Settlement Agreement water temperature targets, which in turn

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could lead to a reduction in the level of reliability of protection of Cold beneficial uses and potentially to a failure to protect those resources, see Sections 2.1 and 2.2 above. The Table S8 water temperature requirement would also result in reduced efficiency in the use of limited reservoir coldwater pool resources which could result in an increase in the frequency in which the facilities lose water temperature management control, see Sections 2.2.4 above. For these reasons, DWR requests that the WQC S8 Condition adopt the Settlement Agreement Table 1 Water Temperature targets at Robinson Riffle.

The draft WQC S8 condition that turned the Settlement Agreement Table 1 targets into the Table S8 requirements does not meet the standard for "reasonable" described by the Board (SWRCB 2010b). The existing facilities cannot reliably meet the requirements set in the draft WQC under all conditions. DWR recommends that the WQC Condition S8 adopt the Settlement Agreement Table 1 water temperature targets as targets at Robinson Riffle.

The Board will have an active role in consultation with DWR in the event that Table 1 water temperature targets are not being met and the ability to ensure that the maximum feasible level of protection that can be met with the available coldwater resources is achieved. The Settlement Agreement Article A108 states: "If in any given year the Licensee anticipates that these measures will not achieve the temperatures in Table 1, the Licensee shall consult with the National Marine Fisheries Service, U.S. Fish and Wildlife Service, California Department of Fish and Game, and California State Water Resources Control Board to discuss potential approaches to best managing the remaining coldwater pool in Lake Oroville, which may result in changes in the way Licensee performs the actions in (i), (ii), and (iii)."

Draft WQC Condition S8 should not include the requirement to comply with revised water temperatures at Robinson Riffle and the southern FERC boundary at 10 years after the license issuance regardless of whether facilities modifications are completed or not. The Board attributed an urgency to establish a finite timeline in order to protect Cold beneficial uses. Condition S8 Response, Section 1.2 establishes that Cold beneficial uses are currently being protected under the existing conditions and in Condition S8 Response Section 1.3 that they will be further protected and enhanced by the Settlement Agreement conditions. The Board's expressed need for enforcement of an aggressive timeline for facilities modification or enforcement of a more protective set *of water temperature standards, regardless of the completion of facilities modifications*, in unnecessary and unreasonable. Since the Board's objectives of protecting Cold beneficial uses are already achieved under the current operating conditions, DWR requests that the requirement for implementation of additional enhancements to the water temperature objectives be applied only after facilities modifications have been completed and that the timeline for facilities modifications be defined by the process described in the Settlement Agreement (which should be adopted in the draft WQC S8 condition). If the Board determines that the Settlement Agreement process for the

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facilities modification does not provide enough certainty for the WQC, then DWR recommends that a timeline that is reasonably achievable (e.g. approximately 12 years after license issuance), be used as a target for the completion of facilities modifications, see Section 2.3 above.

Draft WQC Condition S8 sets the future water temperature compliance requirements based on the three year report and that does not provide provisions for revision of those standards based on experience operating the new facilities modifications, see Sections 2.2.6 and 2.3.2 above. DWR requests the Settlement Agreement provision for a 5 year testing period of the facilities modifications prior to the finalization of revised water temperature compliance requirements should also be included in the WQC S8 Condition.

**Section 3 – The use of the river valve as a water temperature management action for the Feather River Fish Hatchery is unjustified**

As will be explained below, the use of the river valve would not change the Project's ability to comply with the existing water temperature requirements set forth in Condition S7 of the draft WQC or the requirements of Table A107B of the Settlement Agreement. Further, the Settlement Agreement did not commit DWR to using the river valve to achieve either the temperature requirements or the temperature targets set forth in the Settlement Agreement.

**Section 3.1 – DWR did not commit to the use of the river valve to meet temperatures**

In the draft WQC, page 10, paragraph 1, it states, "*The SA anticipates that DWR will use the river valve, among other measures, for meeting the hatchery temperature requirements.*" Additionally, in the draft WQC, page 9, paragraph 1, it states, "*The water quality certification condition also includes the commitment in the SA to curtail pumpback operations, remove shutters on the Hyatt intake, and use the river valves (after refurbishment) up to a maximum of 1500 cfs.*"

These are not accurate characterizations of the Settlement Agreement related to the use of the river valve. The Settlement Agreement (DWR 2006) Article A107.2 states, "*The licensee shall seek to not exceed these Maximum Mean Daily Temperatures through operational changes including but not limited to (i) curtailing pump-back operation and (ii) removing shutters on Hyatt intake and (iii) after river valve refurbishment, DWR will consider (emphasis added) the use of the river valve up to a maximum of 1500 cfs...*" DWR's commitment to consider the use of the river valve after refurbishment is not the same as the Board's representation of an implied commitment to use the river valve.

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The draft WQC, on page 9, paragraph 3, states, *"In the past, DWR has used the river valve along with other operational measures to meet hatchery temperature requirements. Impacts of water temperature were evaluated in the Draft Environmental Impact Report (DEIR 2007) with a model using Temperature Control Actions that include the use of the river valve."* Also, the draft WQC, page 10, paragraph 1, states, *"Because of the importance of the river valve for temperature control a measure has been added to the water quality certification that requires a timeline be submitted within six months of license issuance that includes the steps necessary to finalize the repair or refurbishment of the river valve. The condition also allows DWR to propose an alternative method for meeting temperature requirements should use of the river valve prove unfeasible."*

Settlement Agreement Articles A107 and A108 as well as the draft WQC S7 Condition do not anticipate the potential use of river valve until it is refurbished and, if the river valve is refurbished, DWR will consider its use. In the past, DWR utilized the river valve in a few occasions as a water temperature management action for the Feather River Fish Hatchery. This utilization was limited and only after all other available temperature management actions had been taken during dry or critical dry years. During dam construction, the river valve diverted Feather River flows and was never designed to be used as a temperature control device. The issue with the river valve is now a dam safety issue and DWR has been instructed by FERC (FERC 2010 - letter to DWR June 9, 2010) to get FERC's Dam Safety Program approval before using the river valve in the future. In the WQC process, the Board requests the status and results of the river valve investigation. DWR cannot commit to any refurbishment actions and future use of the river valve at this time. Also, DWR cannot accept that the Board Deputy Director for the Division of Water Rights (Deputy Director) has authority of approving or modifying the plans since the Deputy Director does not have authority over dam safety issues. DWR has committed to meet water temperature requirements at the Feather River Fish Hatchery. It is expected that facilities modifications will improve the temperature regime in the River and enable DWR to carry through its long term commitments.

**Section 3.2 – The river valve is not necessary in order to meet the existing temperature requirements**

In the letter from the Board to DWR (SWRCB 2010b) dated July 9, 2010, page 8, paragraph 4, it is stated that, *"Without the use of the river valves, or an alternative method, the temperatures described in the EIR for the Proposed Project may not be achieved."*

As mentioned earlier, DWR conducted an analysis to evaluate the water temperature management implications due to the loss of the use of the river valve as a potential water temperature management action. The analysis compared compliance of the Settlement Agreement with and without the usage of the river valve. It is important to note for the purposes of these comparisons that the 1983 DFG Operating Agreement

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(DFG 1983) water temperature requirements for the Feather River Fish Hatchery (including the plus 4°F water temperature tolerance) are the same as the draft WQC Table S7 Condition.

The results indicated there are no significant differences between the two scenarios in a span of 72 years. Therefore, the loss of the use of the river valve as a potential water temperature management action does not change the Project's ability to comply with the existing water temperature requirements, the draft WQC Table S7 Condition or the Settlement Agreement requirements.

The draft WQC, on page 9, paragraph 1, states, "...temperature requirements in Table 107A are the equivalent to temperatures required by the 1983 Agreement between DWR and the California Department of Fish and Game and currently required by the Oroville license. Table 107A represents the upper limit of the 1983 agreement temperatures for the hatchery. Historic water temperatures have been sufficient for the hatchery to meet its production goals." DWR agrees that the Project consistently meets existing hatchery water temperature requirements, the hatchery has had no disease management problems related to water temperatures and the hatchery consistently meets its production goals (DFG 2005, DFG 2006, DFG 2007 and DFG 2008).

**Section 3.3 – Reporting on river valve and on alternative**

The draft WQC, on page 28, paragraph 5, states, "Within six months of license issuance, the Licensee shall submit a status report describing any progress towards repairing or refurbishing the river valve, and a list of temperature control actions being used or contemplated to meet the Table S7 water temperatures." In the same paragraph it states, "If the Licensee proposes an alternative method for meeting temperature requirements, evidence must be submitted that the alternative method will provide equivalent water temperature control as the river valve."

As explained above, the river valve issue is a long-term dam safety issue and it is not expected to be resolved within six months of license issuance or longer. DWR has committed to meet the temperatures and it will do so with the several control actions as stated in the DEIR (DWR 2007-DEIR Appendix E, Modeling Tools and Results) and also acknowledged in the draft WQC, S7 condition. As discussed in Section 1.1 above, the Project currently complies with the existing water temperature requirements at the hatchery and the draft WQC S7 Table water temperature requirements. In addition, since the Project is currently complying with the existing water temperature requirements without the use of the river valve and modeling indicates that the compliance performance is essentially the same with and without the river valve, the requirement of an alternative method than the river valve as a water temperature management action is unnecessary. The requirement of an alternative method with equivalent water temperature results is circular logic and DWR strongly objects to this requirement.

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The draft WQC, on page 29, paragraph 1, it states, *"If the Licensee cannot meet the water temperature requirements in Table in S7A without facility modification(s), it shall within three years of license issuance, submit a long-term facility modification(s) and operations plan..."*

DWR concurs. As defined in the Settlement Agreement, the 3 year report is where DWR should propose any facilities modifications required for the Project to meet the water temperature targets. The river valve is no different than the other potential facilities modifications and will be addressed in the river valve refurbishment feasibility report and as an alternative in the 3-year report as a potential facility modification. Therefore, the 6 month report on the river valve requested in the draft WQC is unnecessary and premature.

**Section 3.4 – Hatchery intake disinfection system clarification**

The draft WQC, on page 31, paragraph 3, states, *"In the event that anadromous salmonids are passed upstream of the Feather River Fish Hatchery, the Licensee shall install a water disinfection system for the Feather River Fish Hatchery water supply prior to such passage."*

Even though the draft WQC Condition S7 language related to the hatchery disinfection system is adopted verbatim from the Settlement Agreement Article A107.4, DWR recommends that this condition be clarified that the Coho or any other salmonid coldwater reservoir stocking program is not included in the intent of the condition. In the Settlement Agreement Article A107.4, "anadromous" means fish returning from the ocean and then introduced into the Oroville Facilities system upstream of Oroville Dam. Anadromous, in this case, was not intended to include salmonids that are part of the DFG inland stocking program in the Oroville Facilities. Salmonids included in the stocking program for the Oroville Facilities undergo a disease screening process to protect against the introduction of salmonid diseases upstream of the hatchery intake. If the Settlement Agreement article had intended for the implementation of a hatchery water intake disinfection system to be inclusive of the on-going salmonid reservoir stocking program, the Settlement Agreement Article A107.4 would not have been conditional as there is an on-going salmonid stocking program at the Oroville Facilities. DWR appreciates the clarification on draft WQC Condition S7.

**Section 3.5 – Summary**

Current hatchery water temperature management requirements are successfully and consistently met by DWR. The hatchery has no reported water temperature-related problems and consistently meets its production goals. The Project currently complies with existing hatchery water temperature requirements without the use of the river valve. The draft WQC Table S7 water temperature requirements are the same as the existing

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hatchery water temperature requirements, so current compliance with the existing requirements provides assurances to the Board that the draft WQC Table S7 Conditions will be met by the Project. Modeling of the Project operations without the use of the river valve indicates it has essentially the same hatchery water temperature compliance performance as the operations with the river valve as a water temperature management action.

The Settlement Agreement does not commit to the use of the river valve as a water temperature management action for the hatchery, so the fact that the use of the river valve is currently on hold does not change the circumstances with regards to the facilities water temperature compliance method or plan for the hatchery.

Additionally, temperature control is only one of the many measures that may be taken at the hatchery to meet production goals and reliance on the river valve or an equivalent measure is not necessary. As such, DWR requests that the draft WQC S7 Condition be revised to omit the current draft WQC requirement for DWR to include in the 6 month report on the river valve an alternative to replace the function of the river valve as the above discussions have proven it to be an unnecessary requirement and delete the Deputy Directors' approval or modification of the status report. Further, DWR requests that the revised draft WQC S7 Condition clarify that the requirement related to the hatchery water intake disinfection system does not include salmonids that are stocked in the Oroville Facilities as part of the DFG inland stocking program.

**Section 4 – Condition S9 is unwarranted**

The Board has included a requirement that DWR carry out a program that achieves the goals set forth in the HEA. The HEA is an agreement which was entered into between DWR, NMFS, PG&E and several other key stakeholders as an alternative to the Resource Agencies or other parties seeking fish passage on the Feather River. (See the Habitat Expansion Agreement, August 2007, page 2, paragraph G). The HEA is intended to provide additional spawning habitat for spring-run Chinook salmon. In the rationale provided for this requirement on page 13 the draft WQC the Board concludes that this requirement is necessary "...in order to provide reasonable protection for the cold freshwater, spawning, and migration beneficial uses from the ongoing impacts the Project is having and will continue to have on those uses..." As explained below, this requirement is unnecessary because the Cold beneficial uses are currently being met, will be enhanced by implementation of the Oroville Facilities Relicensing Settlement Agreement, and the Board has not provided any evidence that an expansion of spawning habitat for an additional 2,000 to 3,000 spring-run Chinook salmon is necessary in order to reasonably protect the beneficial use which are the subject of this WQC. Moreover, the elements in the Lower Feather River Improvement Program will address the issues associated with the ongoing blockage of upstream salmonid migration by the dam, such as species introgression, therefore making it entirely unnecessary to address those issues through a habitat expansion program. Finally, it

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should be noted that the HEA was designed solely as an alternative to the exercise of NMFS' authority to impose a passage prescription requirement through Section 18 of the Federal Power Act on the Licensees in the Feather River watershed.

**Section 4.1 – Condition S9 is unnecessary in order to protect the existing Cold beneficial uses**

In the rationale provided for the inclusion of an HEA type program on pages 12 through 13 of the draft WQC the Board cites to the fact that the construction of Oroville Dam, along with dams which were constructed prior to Oroville, has blocked passage and reduced available habitat for species, especially spring-run Chinook salmon. The Board then discusses the effects of this blockage and states, "The reduction in spring-run habitat resulted in spatial overlap with fall-run Chinook salmon and has led to increased redd superimposition, competition for limited habitat, and genetic introgression."

As discussed at length in DWR's response to Condition S8 Response, the existing conditions in the Feather River currently meet the Cold beneficial use. Spring-run Chinook salmon currently use both the high flow channel and low flow channel of the lower Feather River for migration, holding, spawning and rearing, and NMFS has concluded that the lower Feather River is and will continue to be an important node of habitat for the survival and recovery of the species. Further, the Board has not provided any evidence of the need for the creation of new habitat in order to accommodate an additional 2,000 to 3,000 spring-run.

As noted in DWR's response to Condition S8, the numbers of returning salmon to the Oroville Facilities have been as high as 200,000 in 2000, with many of those being spring-run Chinook. DWR attempts to estimate the number of spring-run that are in the lower Feather River by counting the number of salmon that enter the Feather River hatchery before June 30. However, due to the limitations of the existing counting system, this estimate is very low compared to the actual number of spring-run holding in the lower Feather River and represents at best only a portion of the spring-run that are actually in the Feather River. DWR currently has only one counting facility, the Feather River hatchery, and there is no way to estimate the number of spring-run that do not enter the facilities. Since 2004 DWR has counted the number of spring-run salmon that return to the hatchery before June 30 (Table 1) by collecting them as they come into the hatchery, tagging them, and then immediately releasing them back into the river to hold over in the summer. Later in the fall spawning season the hatchery generally only gets back 20 to 25 percent of the fish which had been tagged earlier in the year. The remaining spring run are either harvested (when harvest is allowed by DFG) or spawn naturally in the lower Feather River. DWR tracks the success of spring run by collecting data on marked individuals during the fall escapement survey. Data collected since inception of the program indicates that spring run Chinook (as evidenced by the external

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tags they receive during initial entry into the hatchery) successfully spawn at a very high rate, roughly 85-90 percent.

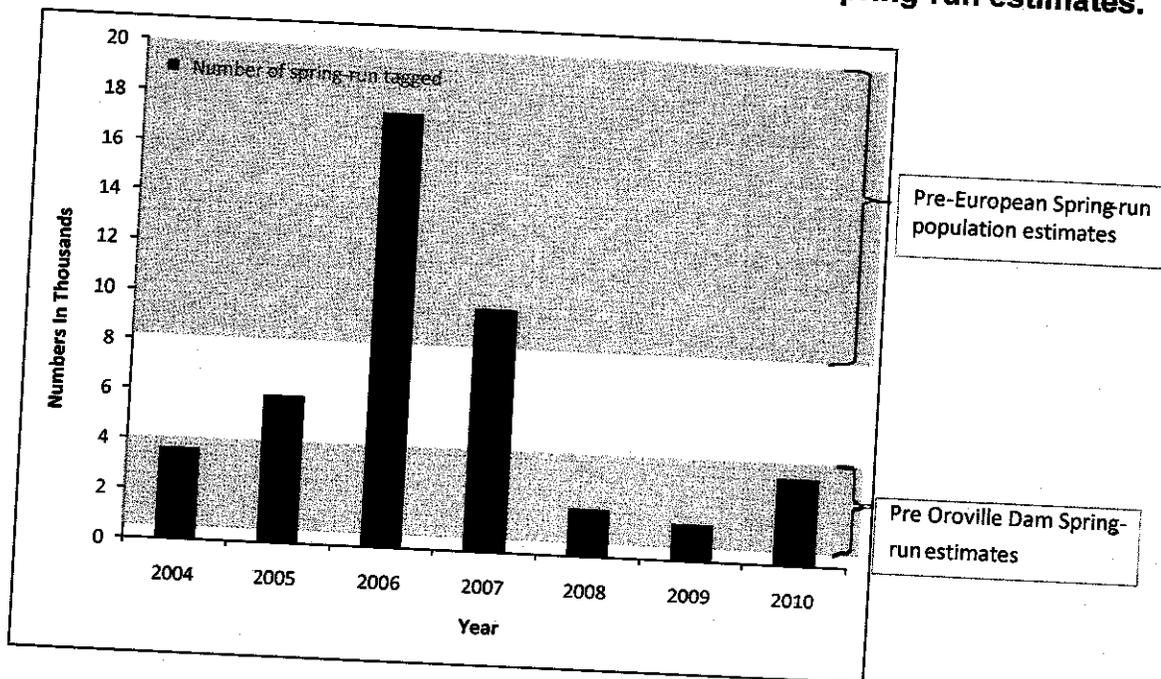
**Table 1. Spring-run tagged at the Feather River Fish Hatchery**

Year	Number
2004	3,650
2005	5,950
2006	17,438
2007	9,756
2008	1,915
2009	1,462
2010	3,502

The 2004-2010 data show that in most of those years the number of returning spring-run Chinook is well above the estimated number of spring-run that returned to the Feather River prior to the construction of Oroville Dam, and is even within the range of the number of spring-run that returned to the Feather River prior to European Settlement (Figure 1). It should be noted that the numbers for 2004 and 2005 are lower than what would have actually been collected due to the requirement to close the hatchery ladder prior to June 30 due to NMFS permit restrictions. With regard to the numbers for 2008 and 2009, the Board should bear in mind that the returns for all Central Valley salmon were at historical lows throughout the Sacramento River basin during those years, and as explained in the response to S8, the low numbers were caused by oceanic conditions and other factors, and were in no way related to the conditions or operations of the Oroville facilities.

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Figure 1. Hatchery spring-run counts and historical spring-run estimates.



While there is no question that the construction of Oroville Dam contributed to the blockage of habitat, when the numbers of spring-run in the Feather River, even the low number tagged at the hatchery, are compared to the number of spring-run that returned to the Feather River historically, it becomes clear that the Oroville Facilities are not impairing the beneficial use for this species. Page 227 of the July 2009 draft NMFS Biological Opinion makes this clear where it states, "As many as 8,000 to 20,000 spring-run Chinook salmon are thought to have occupied the Feather River above the current Oroville dam annually prior to European settlement (Moyle 2002). Between 1946 and 1963, prior to Oroville dam construction, DWR (2006) estimated annual spring-run Chinook salmon numbers of between 500 and 4,000 fish." (emphasis added).

Setting aside the fact that the numbers of spring-run counted by DWR since 2004 are low compared to the actual number of fish that return to the river to spawn, the data shows that the numbers of fish that are tagged at the hatchery alone are within the 500 to 4,000 range that returned to the Feather River before the dam was built, and are within the estimated numbers of spring-run that returned to the Feather River prior to European settlement. In fact, the number of spring-run that were counted at the hatchery in 2006, 17,438, is very close to the maximum estimated number of 20,000 fish that returned to the Feather River prior to European settlement. When combined with the fact that the 2006 numbers are a low estimate of the actual number of spring-run that returned that year, it is clear that the number of spring-run Chinook that

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returned to the Feather River as recently as 2006 far exceeded the number of spring-run that returned to the Feather River by any historical measure.

Despite the overwhelming evidence that the beneficial uses for spring-run are currently being met, the Board has stated that an HEA type program is necessary in order to provide spawning habitat for an additional 2,000 to 3,000 spring-run, while providing no evidence as to why this additional habitat is necessary for the protection of the Cold beneficial use.

**Section 4.2 – Construction of the Feather River Fish Hatchery is mitigation for blockage of habitat**

In the draft WQC, page 12, paragraph 5, the Board states, "Construction of the Oroville Facilities and Pacific Gas and Electric Company's (PG&E) construction of other hydroelectric facilities on the upper Feather River tributaries blocked passage and reduced available habitat for ESA listed anadromous salmonids Central Valley spring-run Chinook salmon (*Oncorhynchus tshawytscha*) ("spring-run") and Central Valley steelhead (*O. mykiss*) ("steelhead")." In the draft WQC, page 13, paragraph 3, the Board states, "The State Water Board concludes that in order to provide reasonable protection for the cold freshwater, spawning, and migration beneficial uses from the ongoing impacts the Project is having and will continue to have on those uses, expansion of habitat as envisioned in the HEA, to at least partially offset the loss of habitat caused by the Project, is necessary."

As explained in the DEIR, the Feather River Hatchery is an anadromous fish hatchery built to compensate for the loss of spawning grounds and rearing areas for returning salmon and steelhead that resulted from the original construction of Oroville Dam. (See DEIR at pages 3.2-11, 5.4-11 and 5.7-6). Therefore, the impacts of blockage cited in this draft WQC condition have already been mitigated by the hatchery so the imposition of the HEA as a draft WQC condition on that basis is unnecessary and inappropriate. Furthermore, the HEA is not intended to be, nor has it been analyzed as, a form of offsite mitigation pursuant to CEQA.

**Section 4.3 – Conditions for spring-run Chinook salmon will be enhanced with the implementation of the Lower Feather River Habitat Improvement Plan**

Based upon the rationale used by the Board in the draft WQC, it seems that what the Board is attempting to do is address some of the impacts associated with the blockage of habitat by the dam, including redd superimposition, competition for limited habitat, and genetic introgression. As discussed in prior responses to the Board, the EIR for the relicensing of the Oroville facilities, as well as the NMFS draft BiOp, these conditions will be addressed and significantly enhanced by the terms and conditions set forth in the Settlement Agreement, especially Articles A102 through A108, which are described as

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the Lower Feather River Habitat Improvement Plan (LFRHIP), and combined as one program in Article A101. Most notably, the effects of spatial overlap between fall-run and spring-run will be addressed through the implementation of the fish weir program set forth in Article A105 of the Settlement Agreement. This action will dedicate a sufficient amount of spawning habitat for the spring-run population, resulting in a reduction in redd superimposition and the associated egg and alevin mortality, as well as a reduction in pre-spawn mortality due to competition for habitat. It will also substantially reduce the rate of genetic introgression with fall-run Chinook salmon. The EIR for the relicensing of the facilities found that this action will have a long-term beneficial effect on the Cold beneficial use (DWR 2007, DEIR, page 5.2-31).

In addition to the segregation weir, the other actions in the LFRHIP will greatly improve the conditions for spring-run and other species, and address the other issues which are associated with the blockage of the dam. Chief among these is the Feather River Hatchery Improvement Program in A107, which includes an HGMP which will identify and address the genetic impacts of the hatchery program. The other conditions in the lower Feather River associated with the existence of the dam will be addressed and improved by the Gravel Supplementation Plan (A102), the Channel Improvement Program (A103), the Structural Habitat Supplementation and Improvement Program (A104), the Riparian and Floodplain Improvement Program (A106) and the flow and temperature improvements contained in A108. All of the elements of these programs were found in the EIR to be beneficial, and will result in improvements the Cold beneficial use, which is already being met under the existing conditions.

In its draft BiOp, (NMFS 2009) NMFS discussed the stressors on spring-run Chinook salmon, including those associated with the competition for habitat, and analyzed the effect that the LFRHIP will have on the species. NMFS' conclusions on pages 189 through 191 regarding the stressors and the effects of the LFRHIP are worth repeating in their entirety:

"These stressors are expected to adversely affect the population until the measures of the Lower Feather River Habitat Improvement Program are implemented. The program is designed to address these specific stressors on the spring-run Chinook salmon population and will include numerous actions that will improve the population's response to the proposed future operation of the Oroville facilities. Incremental implementation of the actions tied to the program will result in improved conditions that will increase the production, abundance, and life history and genetic diversity of the Feather River spring-run Chinook population. By year 5, gravel augmentation will have recharged approximately 15 significant spawning locations and will increase the quality and quantity of spawning habitat. This increased space for spawning and improved gravel size should increase production and abundance of the population by increasing the carrying capacity of spawning habitat.

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By year 10 of the license, the fish segregation weir will separate the fall- and spring-run Chinook salmon spawners thereby increasing egg survival and fry abundance. The weir also will reduce the level of interbreeding between spring- and fall-run Chinook salmon which will stabilize and begin to improve the genotype of Feather River spring-run Chinook salmon. This will improve the viability of the Feather River population by increasing the abundance and improving genetic diversity. This will also improve the spatial structure of the population by creating conditions where they are geographically isolated from fall-run Chinook salmon.

By year 25, the floodplain improvement plan will be fully implemented and will include habitat restoration measures and pulse flows that will inundate certain floodplain areas to increase juvenile outmigrant growth and survival. This will affect the Feather River population by improving juvenile growth, survival, and abundance." This conclusion is further bolstered by NMFS' summary of the effects of the proposed license on spring-run Chinook salmon beginning on page 240 of the draft BiOp. The summary concludes with the following statement, "Therefore, we conclude that although the proposed action will continue to affect spring-run Chinook salmon by blocking access to historic upstream habitat, improvements below the dam can support an abundant population that will improve in terms of genetic and life history diversity through the implementation of the conservation measures in the proposed action will improve the viability of the Feather River population of Central Valley spring-run Chinook salmon in both the hatchery and the wild."

NMFS' conclusions speak for themselves and run counter to the notion that any additional actions, especially the imposition of an HEA type program, are necessary in order to protect the existing beneficial uses for spring-run Chinook.

**Section 4.4 – Summary**

From the foregoing discussion, it is clear that the beneficial uses related to spring-run Chinook salmon are currently being met, and that they will be greatly enhanced as a result of the terms and conditions contained in the Settlement Agreement. For purposes of this draft WQC, there is no demonstrated need to provide for additional spawning habitat as contemplated by the HEA. For all of these reasons, as well as the other policy considerations which have been identified by DWR in its prior correspondence to the Board and its staff regarding the HEA, DWR respectfully requests that the Board remove Condition S9 from the draft WQC in its entirety. In the alternative, while DWR does not believe the Board has the authority to include an HEA type requirement under these circumstances, to the extent the Board believes it is necessary to include such a provision, DWR requests that the Board do so as part of its reserved jurisdiction to modify the WQC at a later date.

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**Section 5 – Additional issues of concern**

While this letter focuses on Conditions S7, S8 and S9 in the draft WQC, DWR still has concerns with several of the other changes made to the Settlement Agreement, and reiterates the concerns expressed in its February 23, 2010 and April 8, 2010 letters. Most notably, DWR believes it is unnecessary for the Deputy Director to have final approval and modification authority for certain plans that have been approved by the Ecological Committee. In the July 9, 2010 letter, the Board has concerns that the Board cannot meet its independent regulatory responsibilities unless the Deputy Director has final approval authority over the plans. While DWR acknowledges that the Board must maintain a reasonable assurance that the measures in the WQC certificate will be implemented, it should be noted that the terms and conditions of the WQC are enforceable by law and DWR must comply with them. The Board's ability to independently act upon or enforce the terms of the WQC is in no way diminished if the Deputy Director does not have final approval of the plans. The plans that will be developed must meet any terms of the WQC and be protective of the beneficial uses, and it is expected that the Board will have a significant influence on the development of the final plans, especially in light of the fact that both the State Board and the Central Valley Regional Water Quality Control Board will have staff at the Ecological Committee meetings, and all parties to the Settlement Agreement expect that the interests of both the State and the Regional boards will be represented at those meetings. DWR respectfully requests once more that the requirement that all plans go to the Deputy Director for final approval be removed, and that the WQC retains the structure for the development of the plans as set forth in the Settlement Agreement.

With respect to the Board's contention that it is necessary to include a reservation of authority by the Deputy Director to approve, and modify as necessary, certain plans related to wildlife, the Board explains in its July 9, 2010 letter that these conditions are necessary to ensure that water quality remains protective of these species. DWR does not dispute that the Board has the authority, and in fact the duty, to protect water quality for the species in question. However, the water quality issues that may impact the species are covered in the water quality provisions of the draft WQC, most notably Condition S12, which is the comprehensive water quality monitoring program. The conditions that DWR objects to deal with different issues, such as the management of the Oroville Wildlife Area, which is controlled by the Department of Fish and Game, or the minimization of the disturbance to nesting bald eagles. Not a single one of the conditions in S15 through S21 (Articles A115 through A122 in the Settlement Agreement) address water quality, and the Board has not presented a logical connection between the two. For example, Condition S17 (which is A118 in the Settlement Agreement) calls for the inclusion of any measures prescribed by the U.S. Fish and Wildlife Service in its final Biological Opinion in any bald eagle management plans, as well as the development of a bald eagle nest territory plan. Any issues related to water quality that may affect bald eagles, such as toxins in the waters that they may

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drink or eat fish from, are handled in the water quality conditions. However, it is a fallacy to say that a bald eagle nest territory plan would affect, or be affected by, water quality issues. The same can be said for the protection of Valley Elderberry Longhorn Beetles (A120), the construction and recharge of brood ponds, or any of the rest of the articles listed above. These articles would in no way affect or be affected by water quality, which is what the WQC addresses. DWR therefore once again respectfully requests that the conditions S15 through S21 be removed in their entirety.

With regard to the Board's response to DWR's comments on the general terms and conditions, as well as the Mitigation, Monitoring and Reporting Plan (MMRP), DWR reiterates its comments on those measures from its February 23, 2010 and April 8, 2010 letters. With regard to the General Conditions, DWR once again requests that the Board delete General Conditions G2 through G6, modify the language in G7 as earlier requested, and include language in G9 through G11 that makes it clear that any exercise of authority by the Board pursuant to those conditions be subject to notice and opportunity for hearing. With regard to the MMRP measures 1 through 3, the DWR once again requests that exceptions be made in the plan to allow for increased turbidity in Measure 1, that Measure 2 be deleted in its entirety, and that Measure 3 be amended as originally requested.

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# United States Department of the Interior

OFFICE OF THE SOLICITOR

Pacific Southwest Region

2800 Cottage Way

Room E-1712

Sacramento, California 95825-1890

September 21, 2010

IN REPLY  
REFER TO:

Henry Ramirez  
Oroville Facilities Relicensing Program  
Department of Water Resources  
P.O. Box 942836  
Sacramento, CA 94236-0001

Subject: Oroville Facilities, FERC License No. 2100

Dear Mr. Ramirez:

The Department of Water Resources (DWR) has asked that the Department of the Interior provide comments on the State Water Resources Control Board's ("Control Board") July 2, 2010, "Draft Water Quality Certification" and the Control Board's "Response to Comments on the January 21, 2010, Draft Water Quality Certification." While the Department of the Interior is not a party to the Control Board's proceeding, it was a signatory to the 2006 Settlement Agreement for Licensing the Oroville Facilities, in the above-referenced Federal Energy Regulatory Commission matter. As a signatory to the 2006 Settlement Agreement, the Department of the Interior, on behalf of its component bureaus, i.e., the Bureau of Indian Affairs, the Bureau of Land Management, the Bureau of Reclamation, the Fish and Wildlife Service, and the National Park Service, supports fully the Settlement Agreement and the Protection, Mitigation and Enhancement measures contained in Appendix A of that Agreement.

Thank you for your attention.

Sincerely,

Daniel G. Shillito  
Regional Solicitor