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## State Water Resources Control Board

April 3, 2020

Kristin White,  
Operations Manager, Central Valley Project  
U.S. Bureau of Reclamation  
[knwhite@usbr.gov](mailto:knwhite@usbr.gov)

### ORDER 90-5 SACRAMENTO RIVER TEMPERATURE MANAGEMENT PLANNING

Dear Ms. White:

This letter is in regard to State Water Resources Control Board (State Water Board) Order WR 90-5 requiring the U.S. Bureau of Reclamation (Reclamation) to maintain temperatures on the Sacramento River for the protection of fish and wildlife, including winter-run and other runs of Chinook salmon and other native species. State Water Board staff appreciated the opportunity to meet with you and other Reclamation staff recently on this and other matters. As discussed in that meeting, the State Water Board will require additional information to inform consideration of a temperature management plan this year, including evaluation of additional operational scenarios within Reclamation's control to manage temperatures on the Sacramento River that comply with Order WR 90-5.

Order WR 90-5 requires Reclamation to operate Keswick Dam, Shasta Dam, and the Spring Creek Power Plant to meet a daily average water temperature of 56 degrees Fahrenheit (F) on the Sacramento River at Red Bluff Diversion Dam (RBDD) during periods when higher temperatures will be detrimental to fish. If there are factors beyond Reclamation's reasonable control that prevent Reclamation from meeting 56 degrees F at RBDD, Reclamation in consultation with staff from the State Water Board, fisheries agencies, and the Western Area Power Administration, may develop a plan and propose that the compliance point be moved upstream. The 2009 National Marine Fisheries Service (NMFS) Biological Opinion (BiOp) for the Central Valley Project and State Water Project included similar requirements for temperature management and planning.

In 2019, a revised BiOp was issued by NMFS, including provisions for managing Sacramento River temperature. Reclamation's Project Description for the 2019 NMFS BiOp (Project Description) identifies a 4 tiered method for temperature management. Under the Project Description, the temperature compliance point would be moved

E. JOAQUIN ESQUIVEL, CHAIR | EILEEN SOBECK, EXECUTIVE DIRECTOR

nearly 50 miles upstream of RBDD to the Sacramento River above Clear Creek (CCR), which is 12 miles downstream of Keswick Dam. In Tier 1 years, Reclamation would target a daily average temperature of 53.5 degrees F at CCR (resulting in a temperature of 56 degrees F downstream of CCR but likely not to RBDD) from May 15 through October 31. In Tier 2 years, Reclamation would target a daily average temperatures of 53.5 degrees F at CCR for a portion of the temperature management season centered on the projected time when the winter-run eggs have the highest dissolved oxygen requirement (37–67 days post fertilization), depending on cold water storage levels and spawn timing of winter-run Chinook salmon, with a target temperature of 56 degrees F outside this time period between May 15 and October 31. In Tier 3 years, Reclamation would target a temperature of 56 degrees F at CCR from May 15 to October 31, with possible limited periods of lower temperatures during the period of greatest temperature stress to winter-run early life stages depending on cold water resources. In Tier 4 years, Reclamation would operate to a higher daily average temperature than 56 degrees F at CCR based on available cold water resources.

Reclamation's Project Description indicates that Reclamation will submit a draft temperature management plan identifying which tier is proposed to be operated to each year to NMFS and the State Water Board (pursuant to Order WR 90-5) in April following completion of the April forecast, with a final plan in May. Although Reclamation proposes to submit a draft plan in April and a final plan in May, depending on the circumstances in any given year, submittal of a draft plan in April may not satisfy Reclamation's obligations under Order WR 90-05. Particularly when the hydrology is dry, planning starting earlier in the water year will be required.

On March 25, Reclamation provided an updated forecast and associated water temperature modeling and temperature dependent winter-run Chinook salmon egg mortality modeling to the Sacramento Temperature Task Group (SRTTG). The forecast indicates that this is likely to be a Tier 3 or 4 year with significant temperature management concerns. Under Reclamation's proposed release schedule, the temperature dependent egg mortality modeling indicates that there would likely be very high temperature dependent egg mortality this year. The modeling indicates that this year Reclamation will likely be unable to meet temperatures lower than 56 degrees F at CCR and maintain temperature control until October 30. This scenario results in an expected median egg mortality of 83% (with a mean of 75%). A scenario with lower temperatures of 53.5 degrees F at CCR was also evaluated that resulted in somewhat lower mortality (mean of 47% and median of 46%), but the modeling for that scenario is not reliable because the scenario results in Shasta Temperature Control Device side gate operations mid-season (partial side gates starting July 20 and full starting August 12). Reclamation's temperature model does not accurately model temperatures when sides gates are used, which results in loss of temperature control. The modeling was conducted assuming a 90% hydrologic exceedance forecast and 25% warmest recent meteorological conditions. Reclamation indicated that current runoff conditions are trending drier than the 90% exceedance forecast. It is also possible that temperatures will be warmer than the 25% meteorological conditions, which will further impact temperature management potentially resulting in higher mortality under Reclamation's

proposed operations. While conditions will continue to evolve this year, at this point in the year, it is not likely that there will be significant improvements to the forecasted conditions.

In order to support the State Water Board's decision-making processes on possible movement of the temperature compliance point upstream of RBDD, the State Water Board requires that Reclamation submit information to evaluate additional actions within Reclamation's control to manage temperatures on the Sacramento River in a manner that would be more protective. This information is required to be submitted with the draft temperature management plan by close of business on April 22 prior to the April 23 SRTTG meeting. While these scenarios may not reflect Reclamation's proposed operations, evaluation of these scenarios is intended to identify possible other options and their tradeoffs to inform the State Water Board's consideration of approval of movement of the temperature compliance point upstream.

If Reclamation's proposed operations are consistent with Tiers 3 or 4, Reclamation is directed to submit modeling and evaluations of improved temperature management operational scenarios within Reclamation's control. Actions within Reclamation's control include deliveries of water diverted under Reclamation's water rights, including deliveries to settlement and exchange contractors. Reclamation should evaluate different water supply delivery assumptions to provide for improved cold water pool maintenance, including evaluation of lower releases from Shasta Reservoir during the spring and summer that meter out the cold water pool resources in order to provide for improved temperature control throughout the temperature control season and improved cold water pool levels going into next year. Specifically, Reclamation is directed to evaluate the possibility of achieving Tier 1 conditions this year (a daily average temperature of 53.5 degrees F at CCR from May 15 to October 31). Reclamation is also directed to evaluate a scenario that would achieve Tier 2 conditions (53.5 degrees F at CCR for the maximum duration included in Tier 2, which should be specified). If this is a Tier 4 year, Reclamation is further directed to evaluate a scenario that would achieve the most protective Tier 3 conditions (53.5 degrees F at CCR for the maximum duration included in Tier 3, which should be specified). For all scenarios, Reclamation should identify the locations at which a daily average temperature of 56 degrees F will be met during the May 15 to October 31 time period and the projected temperature levels at RBDD during the season.

The scenarios should include operational assumptions, including base flow levels, that avoid winter-run and fall-run redd dewatering and stranding concerns and redirected impacts to other species on the Sacramento River and other areas. The scenarios should include full systemwide operational forecasts and temperature modeling results assuming a 90% hydrologic forecast and 25 and 10% meteorological conditions (a 10% meteorological condition should also be evaluated for Reclamation's proposed operations) through the end of October that can be readily compared. NMFS' modeling results of temperature-dependent winter-run Chinook salmon mortality should also be included. Reclamation should include a clear description of the assumptions for each operational scenario and the bases for those assumptions. State Water Board staff is

available to discuss these scenarios with Reclamation and fisheries agency staff. Upon receipt of the draft plan and associated evaluation of other scenarios in April, the State Water Board will make the plan available for public comment for a 2 week period. Input from the State Water Board and fisheries agencies and the public should inform Reclamation's development of a final plan in May. The State Water Board also strongly supports Reclamation's efforts to work with water users to develop possible voluntary measures to improve temperature protection this year and the incorporation of such measures in the temperature management plan.

In order to improve the planning, evaluation, monitoring, and reporting actions that occurred during recent drought years, the State Water Board previously requested that Reclamation develop a protocol for temperature management planning pursuant to Order WR 90-5 to ensure that the requirements of Order WR 90-5 are met. Reclamation provided a one-year protocol and indicated that it would provide a longer-term protocol following completion of the revised NMFS BiOp. The State Water Board renews its request for an updated temperature management planning protocol now that the BiOp has been completed. A draft protocol should be developed in consultation with the State Water Board and fisheries agencies and submitted to the State Water Board for consideration by September 15, 2020. The protocol should address the following, as well as other issues identified by State Water Board and fisheries agency staff during consultation:

1. Early planning and consultation (prior to initial water supply delivery determinations) with the State Water Board and fisheries agencies;
2. Evaluation of a range of temperature management scenarios within Reclamation's reasonable control each year in addition to Reclamation's proposed operations;
3. Measures to ensure regular, accurate, and transparent reservoir and river temperature monitoring;
4. Needed improvements to temperature modeling and forecasting;
5. Measures to avoid stranding and dewatering;
6. Measures to avoid redirected impacts to fish on other tributaries and in the Delta;
7. Potential voluntary measures by other water users;
8. Specific measures to address droughts, including measures to provide year to year carryover storage; and
9. Improvements to temperature management planning and implementation based on new science and changing circumstances.

State Water Board staff looks forward to continuing to work with you to ensure compliance with Order WR 90-5, including through voluntary measures where possible. If you have any questions regarding this letter, please contact Diane Riddle at [diane.riddle@waterboards.ca.gov](mailto:diane.riddle@waterboards.ca.gov) or (916) 341-5297. Please be aware that due to the public health concerns regarding the novel COVID-19 virus and the resulting pandemic, many Division of Water Rights staff are telecommuting; therefore, the best avenue of communication at this time is via email.

Sincerely,

*ORIGINAL SIGNED BY*

Eileen Sobeck  
Executive Director  
State Water Resources Control Board

cc: Sacramento River Temperature Task Group (via email)