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## State Water Resources Control Board

June 16, 2023

Kristin White  
Central Valley Project Operations Manager  
U.S. Bureau of Reclamation  
knwhite@usbr.gov

### ORDER 90-5 SACRAMENTO RIVER DRAFT TEMPERATURE MANAGEMENT PLAN

Dear Ms. White:

This letter is in response to the U.S. Bureau of Reclamation's (Reclamation) Final Sacramento River Temperature Management Plan (TMP) submitted on June 7, 2023, pursuant to State Water Resources Control Board (State Water Board or Board) Water Right Order 90-5. The TMP is conditionally approved, as described below.

#### Background

Order 90-5 included conditions in the water right permits and licenses for Keswick Dam, Shasta Dam, and the Spring Creek Power Plant that obligate Reclamation to meet temperature requirements on the Sacramento River for the protection of Sacramento River fish species, including winter-run and fall-run Chinook salmon. Specifically, Order 90-5 requires Reclamation to operate to achieve an average daily temperature of 56 degrees Fahrenheit (F) on the Sacramento River at Red Bluff Diversion Dam (RBDD), located 60 miles downstream of Keswick Dam, to protect aquatic habitat conditions for spawning, rearing, and migration needs of salmon and other native fish populations during periods when higher temperatures would adversely affect the fishery. If there are factors beyond Reclamation's reasonable control that prevent Reclamation from meeting 56 degrees F at RBDD, Reclamation is required to identify an alternative compliance location and prepare an associated TMP for consideration by the State Water Board.

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

### The 2023 Sacramento River TMP Development

The Sacramento River watershed and the entire Central Valley are currently experiencing wet conditions. Shasta Reservoir benefited from these wet conditions and the current storage of Lake Shasta is 4.4 million acre-feet (MAF), the maximum storage of Lake Shasta. Accordingly, Reclamation is currently making releases from Shasta Dam equivalent to inflows into the reservoir to maintain maximum storage.

On April 26, 2023, Reclamation released a Draft TMP reflecting the favorable storage conditions in Lake Shasta. The Draft TMP outlined a release schedule for the irrigation season that peaked at 10,000 cubic feet per second (cfs) in May, remains between 8,000 cfs or 9,000 cfs from June through August, and tapers off to 7,000 cfs in September. Modeling results indicate that the end of September (EOS) storage would be 3.3 MAF. Based on this release schedule, a conservative above average meteorology and the CVP's May 90% forecast of operations, Reclamation developed a draft temperature management strategy that included a temperature management target of 53.5 degrees F on the Sacramento River upstream of the Clear Creek confluence (CCR gauge, river mile (RM) 290) from May 15 through October 31. Based on these operations, National Marine Fisheries Service (NMFS) modeling indicates an estimated winter-run Chinook salmon egg (stage independent) temperature dependent mortality (TDM) of 2% and Reclamation modeling indicates a TDM of 0%. Additionally, Reclamation modeling estimated EOS cold water pool storage of 1.27 MAF.

In addition to the Sacramento River temperature management strategy, operations and diversions from the Trinity River are scheduled to be kept at a minimum throughout the temperature management season. Trinity Reservoir has not recovered as strongly as Lake Shasta and current storage is only 1.3 MAF (69% of historic average). In a memo to Reclamation, the Trinity River Restoration Program (TRRP) expressed concerns that low storage in Trinity Reservoir may result in temperature management challenges late in the season, particularly for Endangered Species Act (ESA) listed Coho Salmon that spawn in November and December and require colder water temperatures than Chinook Salmon. Notwithstanding the TRRP memo, minimum diversions have been identified as a critical temperature management strategy on the Trinity River as it reduces the residence time of water in Lewiston Reservoir and minimizes the downstream warming of Trinity Dam releases.

Due to the favorable conditions this year, an evaluation was requested to evaluate the feasibility of maintaining 53.5 degrees F at a location downstream of CCR. The next downstream gaged location is Balls Ferry, which is 14 river miles downstream of CCR. Modeling results for meeting a temperature of 53.5 degrees F at Balls Ferry were provided to the Sacramento River Temperature Task Group (SRTTG) on May 18. These results indicate that such operations would deplete cold water pools to low levels

that may risk late season temperature management as indicated by use of both side gates (an indication that loss of temperature control is impending and for which the temperature modeling is not reliable) and slow increases in water temperatures released from Shasta Reservoir through the management season. These operations could strain temperature management in the fall months for both winter-run and fall-run Chinook salmon protection. The possible inability to meet 53.5 degrees F at Balls Ferry for the entire season indicates that Reclamation would be unlikely to be able to meet a daily average temperature of 56 degrees F at the downstream Order 90-5 RBDD compliance location under the current operations forecast. Considering that risk, as well as the fact that under the proposed TMP modeling estimates of TDM for winter-run Chinook are 2 percent and 0 percent, it would not be reasonable to require Reclamation to meet a temperature target of 53.5 degrees F at Balls Ferry or 56 degrees at RBDD.

The Draft TMP proposed to meet a temperature of 53.5 degrees F at CCR. The conservative modeling in the Final TMP shows that generally it is expected that meeting 53.5 degrees F at CCR equates to meeting temperatures of 56 degrees F or lower at Balls Ferry. However, the modeling also shows that there could be instances of temperatures above 56 degrees F at Balls Ferry when operating to meet 53.5 degrees F at CCR. To inform the Board's consideration of the TMP, staff requested that Reclamation evaluate an operational strategy for consistently meeting a temperature of 56 degrees F at Balls Ferry.

#### The Final TMP

On June 7, 2023, Reclamation submitted the final TMP to the State Water Board that is supported by the fisheries agencies (including the National Marine Fisheries Service, U.S. Fish and Wildlife Service, and Department of Fish and Wildlife). The Final TMP reflected the temperature management strategy of the Draft TMP, with a temperature target of 53.5 degrees F at CCR from May 15 through October 31 and an increased modeled EOS cold water pool storage of 1.5 MAF (TMP Attachment 2). In addition, the Final TMP included modeling which evaluated a strategy with the temperature compliance location at Balls Ferry per the Board's request. Those results indicate that operating to fully meet 56 degrees F at Balls Ferry for the duration of the season may require use of the TCD's side gates as early as July (TMP Attachment 3). Such operations may pose an unreasonable risk to temperature management later in the season. The TMP is conditionally approved in recognition of these factors and in recognition of the importance of preserving Reclamation's capability to maintain cold water releases necessary to support winter-run, as well as spring- and fall-run Chinook salmon spawning and egg incubation. This is particularly true due to the drought related impacts that have occurred in recent years to spring- and fall-run Chinook salmon and the resulting closure of the recreational and commercial California ocean salmon fisheries, comprised largely of fall-run Chinook salmon.

Conditional Approval of the TMP

Conditions this year are optimal for agricultural, municipal, and industrial water supplies, and for protection of the fisheries. As discussed above, Reclamation's final TMP indicates that its strategy of meeting 53.5 degrees F at CCR will likely result in average daily temperatures at or near 56 degrees F at Balls Ferry, while acknowledging that conservative modelling demonstrates there may be instances where meeting 56 degrees at Balls Ferry could require operations that are detrimental to optimal temperature management throughout the season (e.g., side gate operations). Thus, it is our expectation that 56 degrees average daily water temperature will generally be achieved at Balls Ferry unless doing so would entail an unacceptable risk to the attainment of other temperature management goals. I have determined that Reclamation's final TMP complies with Order 90-5 and is approved, subject to the conditions set forth below:

1. Reclamation shall notify the State Water Board within 72 hours if real-time conditions or ongoing evaluation indicate that daily average water temperatures of 56 degrees F will not be achieved at Balls Ferry and provide a description of the factors beyond Reclamation's reasonable control (e.g., extreme heat event, high temperature inflows downstream of Clear Creek) that would make achieving 56 degrees F at Balls Ferry detrimental to the fishery and overall temperature management throughout the temperature management season.
2. Reclamation shall continue to evaluate observed conditions and consult with the fisheries agencies and State Water Board as appropriate to maximize protections for winter-, spring-, and fall-run Chinook salmon should conditions worsen relative to the conservative forecasts used to develop the TMP.
3. I reserve continuing authority to modify my approval of the TMP to ensure compliance with Order WR 90-5 in light of new information or changed circumstances.

Thank you for your continued cooperation and coordination on this matter. If you have any questions regarding this letter, please contact Diane Riddle at [diane.riddle@waterboards.ca.gov](mailto:diane.riddle@waterboards.ca.gov).

Sincerely,



Eileen Sobeck  
Executive Director  
State Water Resources Control Board