State Water Resources Control Board

TO: Department of Water Resources (DWR)
Attention: Delta Conveyance Office

VIA ELECTRONIC MAIL
deltaconveyancecomments@water.ca.gov

ORIGINAL SIGNED BY

FROM: Diane Riddle
Assistant Deputy Director
DIVISION OF WATER RIGHTS

DATE: December 16, 2022

SUBJECT: COMMENTS ON DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE DELTA CONVEYANCE PROJECT

This memorandum provides comments on the California Department of Water Resources' (DWR) July 27, 2022, Draft Environmental Impact Report (Draft EIR) for the Delta Conveyance Project (Project). The State Water Resources Control Board (State Water Board) and Central Valley Regional Water Quality Control Board (Central Valley Water Board) (collectively Water Boards) appreciate the opportunity to comment on the Draft EIR.

General Comments

The mission of the Water Boards is to preserve, enhance, and restore the quality of California's water resources and drinking water for the protection of the environment, public health, and all beneficial uses, and to ensure proper water resource allocation and efficient use for the benefit of present and future generations. The State Water Board administers water rights in California, including those of the State Water Project (SWP) and Central Valley Project (CVP). The State and Regional Water Boards also have primary authority over the protection of the State's water quality and drinking water. To protect water quality, the State and Regional Water Boards develop water quality control plans that designate beneficial uses of water, establish water quality objectives to protect those beneficial uses, and include a program of implementation to

achieve the objectives. Water quality control plans also include requirements for monitoring, special studies, and reporting. These water quality control plans include the State Water Board's Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan) and the Central Valley and San Francisco Bay Regional Water Boards' Water Quality Control Plans for the Central Valley and San Francisco Bay.

The Water Boards will have discretionary approvals over water right and water quality aspects of the Project and are responsible agencies for the Project pursuant to the California Environmental Quality Act (CEQA). As responsible agencies under CEQA, the Water Boards must review and consider the environmental impacts of the Project identified in the EIR that are within their purview and reach their own conclusions on whether and how to approve the Project. (Cal. Code Regs., tit. 14, § 15096, subd. (a).) Specifically, activities that will require approval by the Water Boards include changes to the SWP's and potentially the CVP's water rights to add points of diversion of water to those rights, water quality certification pursuant to Clean Water Act section 401,[1] National Pollutant Discharge Elimination System Permits (NPDES),[2] and potentially other water quality approvals such as a Construction Storm Water General Permit,[3] an Industrial Storm Water General Permit,[4] Waste Discharge Requirements,[5] and a Dewatering Permit.[6] The EIR is also expected to provide information necessary to inform the Water Boards' decision making under the California Water Code, including whether and under what conditions needed approvals should be granted.

On April 15, 2020, the Water Boards submitted a comment letter (attached) on DWR's Notice of Preparation (NOP) of an Environmental Impact Report (EIR) for the Project. The Water Boards identified issues that should be addressed in the development of the Draft EIR, including issues related to the CEQA baseline upon which alternatives are

[1] A permit pursuant to Section 404 of the Clean Water Act is required from the United States Army Corps of Engineers (USACE) because the Project will involve the discharge of dredged or fill material in navigable waters or wetlands. In connection with the USACE permit required for this Project, a Water Quality Certification must be obtained from the State Water Board.

[2] If the proposed project includes construction dewatering and it is necessary to discharge the groundwater to waters of the United States, the proposed project will require coverage under a NPDES permit. If the proposed project discharges waste that could affect the quality of surface waters of the State, other than into a community sewer system, the proposed project will require coverage under a NPDES permit.

[3] Dischargers whose project disturbs one or more acres of soil or where projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction Activities (Construction General Permit), Construction General Permit Order No. 2009-009-DWQ.

[4] Storm water discharges associated with industrial sites must comply with the regulations contained in the Industrial Storm Water General Permit Order No. 2014-0057-DWQ.

[5] If USACE determines that only non-jurisdictional waters of the State (i.e., "non-federal" waters of the State) are present in the proposed project area, the proposed project may require a Waste Discharge Requirement permit to be issued by the Central Valley Regional Water Quality Control Board.

[6] If the proposed project includes construction or groundwater dewatering to be discharged to land, the proponent may apply for coverage under State Water Board General Water Quality Order (Low Risk General Order) 2003-0003 or the Central Valley Regional Water Quality Control Board's Waiver of Report of Waste Discharge and Waste Discharge Requirements (Low Risk Waiver) R5-2013-0145.

compared; evaluation of a range of operational alternatives, including alternatives that incorporate possible updates to the Bay-Delta Plan; impacts that should be evaluated on aquatic ecosystems and species, water quality, and legal users of water; evaluation of climate change effects; and monitoring and evaluation actions under the proposed Project. Water Boards staff reviewed the Draft EIR for the major issues identified in the NOP and provide the following general comments and specific comments identified in the attached table.

Baseline Regulatory Conditions:

For the evaluation of Project impacts, the Draft EIR assumes baseline conditions include State Water Board Decision 1641 (D-1641) implementing the 1995/2006 Bay-Delta Plan, the 2019 Biological Opinions (BiOps) issued by the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS), and the 2020 Incidental Take Permit (ITP) issued by the California Department of Fish and Wildlife (CDFW) on the Coordinated Long-Term Operations (LTO) of the SWP and CVP. The State Water Board's comments on the NOP recommended that the EIR evaluate the effects of the Project with and without the recent 2019 changes to the BiOps. The State Water Board indicated that it is important to understand the effects of the 2019 BiOps in combination with the proposed Project because the State has filed suit on the 2019 BiOps which may result in modifications to or invalidations of those BiOps. In addition, the changes to the BiOps are not well understood because they were made recently and have not been fully implemented due to court orders and drought conditions. The 2019 BiOp changes could have large effects on export operations and Delta hydrodynamics as well as aquatic species (Reclamation's Environmental Impact Statement identified that the 2019 BiOp changes could result in increases in exports of up to 600 thousand acre-feet per year on average given existing infrastructure). These effects in combination with the effects of the Project should be evaluated and disclosed. Given the unknown outcome of the litigation and current BiOp reconsultation process, the Water Boards continue to recommend evaluation of both regulatory baselines.

The Draft EIR also does not include an evaluation of recent updates to the Bay-Delta Plan. In 2018, the State Water Board updated the Lower San Joaquin River Flow and southern Delta salinity objectives and associated program of implementation in the Bay-Delta Plan (2018 Bay-Delta Plan). The State Water Board is currently in the process of implementing these updates. Appendix 4C of the Draft EIR (page 4C-2) states that the updated elements of the Bay-Delta Plan are not included in the regulatory baseline conditions in the Draft EIR. The Draft EIR states that 2018 Bay-Delta Plan update elements were not included because the south Delta salinity standards metrics of compliance are not yet developed to the point that they can be modeled. However, this does not explain why flow objectives are not evaluated in the Draft EIR. State Water Board staff are available to assist with the development of scenarios that serve this purpose.

Project Operational Alternatives:

The Draft EIR states that the alternatives evaluated in the EIR are the result of an extensive screening process. However, the Draft EIR only includes construction and conveyance capacity related alternatives, despite comments provided by the State Water Board on the NOP and on other occasions indicating that a reasonable range of operational alternatives should also be evaluated given that the operations of the project will have long term effects on the environment well beyond construction. Instead, the Draft EIR includes alternatives combining three tunnel alignments, three north intake locations, and conveyance capacities ranging from 3,000 cubic feet per second (cfs) to 7,500 cfs. The Draft EIR presents Alternative 5 (Bethany Alignment with 6,000 cfs conveyance capacity from two north Delta intake locations, Intakes B and C) as the proposed Project.

The Draft EIR provides only one set of operations criteria for the Project. The Draft EIR also includes an evaluation of a possible alternate regulatory regime in Appendix 4C that includes provisions from the March 2022 Voluntary Agreements (VAs) Memorandum of Understanding proposing voluntary measures for the update and implementation of the Bay-Delta Plan. However, this scenario does not include specific proposed operating criteria for the Project and includes assumptions that are not proposed operating constraints, as described further below.

Water Board staff recommend the EIR evaluate a reasonable range of operational alternatives in order to provide the Water Boards and other responsible agencies with analyses to inform their decision-making processes. This is particularly important given that pursuant to the Delta Reform Act, the State Water Board will need to include appropriate Delta flow criteria for the Project in any approval of a water right change petition needed for the project. These alternatives should include an evaluation of flow criteria for the Project that would improve conditions for native fish species, which are currently in poor condition given the current cumulative impacts to native fish and wildlife species resulting from existing flow modifications and other activities explained in the State Water Board's 2017 Scientific Basis Report in support of potential updates to the Bay-Delta Plan. Flow criteria that would improve Delta outflows, reduce fish entrainment and impingement at SWP (and possibly CVP) diversions, and improve cold water management without redirected impacts to native fish species should be evaluated.

Specifically, the EIR should evaluate a scenario that is consistent with the State Water Board's efforts to update and implement the Bay-Delta Plan to improve protections for native fish species. As mentioned above, the State Water Board updated the Lower San Joaquin River Flow and southern Delta salinity objectives in the Bay-Delta Plan in December 201 and is proceeding to implement these objectives. In July 2018, the State Water Board released a Framework[7] for potential updates to Sacramento River and

[7] The Framework can be found at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/docs/sed/sac_delta_framework_070618%20.pdf

Delta tributary inflows and cold-water habitat, Delta outflows, and interior Delta flow provisions included in the plan based on science summarized in the State Water Board's Scientific Basis Report[8]. These possible updates to the Bay-Delta Plan should be evaluated in the EIR as possible operating constraints on the Project that would mitigate the potential impacts of the Project on fish and wildlife. Although the EIR determines that with mitigation operational impacts from the Project would be less than significant, as explained further below, there is scientific uncertainty concerning whether the habitat restoration actions proposed as mitigation for reduced Delta outflows and other impacts from the Project will be capable of reducing impacts to less than significant levels, particularly with respect to cumulative impacts. Further, while more stringent operational constraints on the Project would not be expected to have additional significant impacts that require evaluation under CEQA, specific evaluations of possible interactive effects would confirm this conclusion and ensure adequate CEQA documentation for the Board's decision-making processes, thereby avoiding possible delays in processing DWR's, and possibly Reclamation's, water right change petition. An analysis of the amount of water that would be available for export using Project facilities if more stringent flow criteria were imposed would also serve to inform the Board's determination concerning what flow criteria are appropriate for the Project.

In addition to more stringent flow criteria, the Water Board's NOP comments also recommended evaluation of possible VA measures proposed by DWR and various water agencies. Although the March 2022 VA was evaluated as a possible alternate regulatory regime in Appendix 4C, that modeling "conservatively assumes the proposed project would not divert excess Delta outflow in January through June during times in which total Delta outflow is less than 29,200 cubic feet per second (cfs)." However, this assumption does not appear to be an operating constraint for the proposed Project. While the assumption is not a proposed operating constraint, the high bypass flow assumption significantly affects the results of the modeling and other analyses, making the evaluation of limited utility in understanding how the proposed Project would interact with a VA and what the proposed operating rules should be to ensure VA flows provide intended benefits. The EIR should evaluate specific proposed operating constraints for the Project with a possible VA regulatory regime. While the Water Boards understand that the term of the VA is proposed to be 8 years, there are also provisions in the VA that would provide for extension of the VA. As such, it is important to understand how this and other proposed new water supply infrastructure would interact with the VA, particularly in cases where the projects involve the same water right holders and water rights involved in the VA.

In addition to the above, operations criteria during continuous, multi-year extreme drought conditions similar to the 2012-2016 and the current (2020-2022) periods should be evaluated. This is particularly important given the challenges meeting water quality

[8] The Scientific Basis Report can be found at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/docs/2022/201710-bdphaseII-sciencereport.pdf

and flow requirements which have occurred during recent drought conditions and the effect that reducing Delta outflows could have on future water quality conditions.

Operations of the North Delta Intakes:

In addition to the above, the EIR should address the following topics related to the proposed operating criteria for the Project as part of alternate operating criteria or as part of the Project (including possible mitigation).

Sweeping and Approach Velocities

The Draft EIR states that the north Delta intakes would be subject to a maximum approach velocity of 0.2 feet per second and a minimum sweeping velocity of 0.4 feet per second at the proposed fish screens (3.16.1.1 Approach and Sweeping Velocity Requirements). Additionally, the sweeping velocity would be at least double the approach velocity to minimize fish drawn to the intakes. The Draft EIR (Section 3.17.2.1 Real-Time Decision-Making Framework) identifies that the average river velocity downstream of the north Delta intakes, estimated as the flow (upstream flow less the diversion flow) divided by the river's cross-sectional area, could be used as a surrogate for the sweeping velocity (page 3-158). The two north Delta intakes would be located in different channel alignments with Intake B on an outside bend of the channel and Intake C on a straight reach. Fish screens located at these locations would experience different hydraulic conditions, e.g., sweeping and approach velocities, even under the same flow conditions. Water Board staff recommend the inclusion of a monitoring strategy to measure and integrate these hydraulic parameters into real-time operational decision making.

The Draft EIR indicates that the approach/sweeping velocity criteria could be relaxed (e.g., allowing for higher approach velocity) when the presence and entrainment risk of Delta smelt at the north Delta intakes is expected to be low based on temperature/calendar off-ramps (page 3-158). However, such relaxation of approach/sweeping velocity criteria without field monitoring for fish presence would risk entrainment of fish species, including Delta smelt and juvenile salmonids. The Project should incorporate fish monitoring to inform relaxation of operating criteria along with a consultation process with regulatory agencies (fisheries agencies and the State Water Board).

Bypass Flow Criteria

Sub-Table A (pages 3-152 through 3-154) provides bypass flow criteria for operations of the north Delta intakes and related Sacramento River flow conditions. The bypass flow criteria in the Draft EIR are the same as those provided in the California WaterFix Project which proposed three north Delta intakes with a maximum diversion capacity of 9,000 cfs. The proposed Project (Alternative 5) would have a maximum diversion capacity of 6,000 cfs. In a study evaluating the effects of the north Delta water

diversions proposed as part of the California WaterFix, Perry et al.[9] (2018a) determined that the October-November bypass rules and Level 3 bypass rules during December-June would considerably increase the frequency and duration of reverse flows at the Sacramento River downstream of Georgiana Slough and the proportion of juvenile salmon entering the interior Delta. Perry et al. (2018a) recommended developing operational rules for the north Delta intakes to control flow reversals that would require detailed real-time predictions of tides and tidally varying river flows in order to account for variation in tidal cycles that affect the frequency, magnitude, and duration of reverse flows at a given Freeport flow. While the proposed Delta Conveyance Project has a lower total possible diversion amount than the California WaterFix Project proposed, it is still possible that the Project could have significant reverse flow effects without appropriate operating constraints. The EIR should evaluate alternative operating constraints consistent with the recommendations of Perry et al. (2018a) that would be more protective of juvenile salmonids.

In a separate study, Perry et al.[10] (2018b) found that as Delta inflows (from the Sacramento River) declined below approximately 1,000 cubic meters per second (m^3/s) (≈35,000 cfs) juvenile salmonid routing into the interior Delta increased and their survival decreased. As inflow declines and tidal influence moves upstream into transitional reaches (defined as the reach between riverine and tidal reaches) in the Delta, both travel time and distance increase because juvenile salmon may be advected upstream on flood tides (Perry et al. 2018b). Based on this research, the EIR should evaluate a range of alternative bypass flows, including higher bypass flow criteria than are currently proposed in the Draft EIR.

The Draft EIR provides three different “Levels” of bypass flow criteria that would be applied during the December through June period. The Draft EIR describes the conditions for moving to higher levels (i.e., from Level 1 to 2, and from 2 to 3) that would allow the Project progressively higher diversions (i.e., less restrictive) at the north Delta intakes. The implementation of bypass flow criteria and progression to the less restrictive diversion criteria could only occur under continued favorable hydrologic conditions (e.g., flows above 20,000 cfs) and when the risks to aquatic resources are low. The EIR should also evaluate alternative operating criteria that would require moving to more restrictive bypass flow criteria (i.e., from Level 3 to 2, and 2 to 1) based on flow and/or fish monitoring.

The proposed minimum bypass flows during October and November are 7,000 cfs; however, the proposed minimum bypass flows during the more sensitive time period for native fish species from December to June are substantially lower at 5,000 cfs

[9] Perry, R.W., J.G. Romine, A.C. Pope, and S.D. Evans. 2018. Effects of the proposed California WaterFix North Delta Diversion on flow reversals and entrainment of juvenile Chinook salmon (Oncorhynchus tshawytscha) into Georgiana Slough and the Delta Cross Channel, northern California: U.S. Geological Survey Open File Report 2018-1028, 46 p., https://doi.org/10.3133/ofr20181028.

[10] Perry, R. W., A. C. Pope, J. G. Romine, P. L. Brandes, J. R. Burau, A. R. Blake, A. J. Ammann, and C. J. Michel. 2018. Flow-mediated effects on travel time, routing, and survival of juvenile Chinook salmon in a spatially complex, tidally forced river delta. Can. J. Fish. Aquat. Sci. 75: 1886–1901. dx.doi.org/10.1139/cjfas-2017-0310.

according to the Sub-Table A. The reasoning for these lower bypass flows should be explained and more protective alternative bypass flows during the December through June period that would provide higher levels of protection for fish residing in the area or migrating through the north Delta intake reaches should be evaluated.

Pulse Protection

The Draft EIR summarizes the conditions for initiation and cessation of (fish) pulse protection criteria in Table 3-14. The pulse protection criteria were developed for the protection of winter-run Chinook salmon and are expected to provide ancillary protection to other anadromous fish species, including steelhead and spring-, fall-, and late fall-run Chinook salmon. The Draft EIR (Section 3.16.1.3 Pulse Protection) states that the pulse protection would be initiated when "a large number, and relatively high concentration, of winter-run-sized juvenile salmonids begin migrating into the Delta from upstream locations" to minimize potential decreases in survival of emigrating salmonids in the north Delta intake reach. However, the initiation criteria for pulse protection described in the Draft EIR is based on flow increases and not fish density in the Sacramento River at Wilkins Slough. For the California WaterFix Project, both the initiation and cessation of the pulse protection operation at the proposed north Delta intakes was informed by fish catch at Knights Landing (Knight Landing Catch Index) (California WaterFix Project ITP 2017). An alternative operating scenario with similar fish catch-based criteria for pulse protection operations should be evaluated in the EIR.

Water Board staff note that the proposed operations include one pulse protection period per water year (after December 1) with the possibility for one additional pulse protection if the pulse period begins before December 1. As stated above, the pulse protection and related low-level pumping criteria were designed to primarily protect winter-run sized Chinook salmon emigrating through the Sacramento River with the first flow pulse. The EIR should also evaluate operating criteria to provide a similar level of protection to other salmonids (spring-, fall-, and late fall-run Chinook salmon and California Central Valley [CCV] steelhead) that might be migrating through the Sacramento River at different times. Previously, the California WaterFix Project ITP (2017) included unlimited pulse protections for winter-run and spring-run Chinook salmon. The EIR should include alternative operating criteria with additional pulse protections that would provide protections for other salmonid fish.

The Draft EIR indicates that a pulse protection period could last for just 5 days or less after the flow peak based on the initiation and ending criteria in Section 3.16.1.3 (page 3-143) and Table 3-15. This could happen during the October-November period when an early-season storm increases flows in the Sacramento River and mobilizes salmonid migration, as occurred in October 2021. The Draft EIR cites the research by del Rosario et al. (2013) for the development of the pulse protection flow criteria and its effective duration. The study (del Rosario et al. 2013) provides information on the patterns of winter-run (sized) Chinook salmon juvenile entry into the Delta, estimated at the Knights Landing rotary screw trap, and Delta exit, estimated at Chipps Island. However, the passage time from Wilkins Slough to Knights Landing and to the north Delta intakes that would inform Project operations has not been determined. The study

by del Rosario et al. (2013) states that the first day that flows at Wilkins Slough reached 400 m^3/s (≈14,000 cfs) or 500 m^3/s (≈17,600 cfs) was one day before the catch spike and within 3-7 days before the median catch (of cumulative catch) at Knights Landing. It determined that the Delta residence time of winter-run Chinook salmon juveniles ranged from 40 to 110 days, with an average of 87 days. Based on this information, the pulse protection and low-level pumping for potentially very short periods, i.e., 5 days, may not provide full protection for the early migrating juvenile salmonids. If a pulse protection begins in the October-November period and ends with five consecutive days of Wilkins Slough flow decreasing after the peak flow, the north Delta intakes could divert a high proportion of the Sacramento River flow that is above the minimum bypass flow criteria of 7,000 cfs. The EIR should evaluate alternative operating constraints that provide for longer bypass flow periods.

Further, the Draft EIR defines the pulse protection criteria as flow in the Sacramento River at Wilkins Slough greater than 12,000 cfs. However, during water year 2021, the flows at Wilkins Slough never exceeded this criteria. The EIR should evaluate alternative operating constraints that would apply when hydrologic conditions meeting the pulse protection criteria do not occur but juvenile salmonids would be migrating.

Spring Delta Outflows (San Joaquin River Inflow to Export [I:E] Ratio)

The EIR should clarify whether the water diverted from the north Delta intakes would be included in assessing the proportional share of export reductions to provide incidental spring outflows during April and May (2020 ITP Condition of Approval 8.10 SWP Proportional Share, 8.17 Export Curtailment for Spring Outflow). The 2020 SWP ITP requires that the SWP reduce exports from April 1 to May 31 of each year to achieve the SWP proportional share of export reductions established by the ratio of San Joaquin River at Vernalis flow to combined CVP and SWP exports (I:E Ratio). The EIR should also clearly describe whether this condition was used as a modeling criterion.

Project Impacts on Water Quality:

Chapter 9 of the Draft EIR evaluates the impacts of the project of water quality. Section 9.3.2 provides a list of conditions for evaluating whether water quality effects resulting from a project alternative would be considered significant under CEQA. Number 8 on that list is “Conflict with or obstruct implementation of a WQCP.” In Section 9.3.4, Cumulative Analysis, the EIR states that “cumulative analysis for water quality in the study area considers past, present, and reasonably foreseeable future projects and programs being completed in combination with the effects of any one of the project alternatives or the No Project Alternative.” Table 9-54 lists the programs, projects and policies evaluated but does not contain the updates and implementation processes for the Bay-Delta Plan described above.

Throughout Section 9.3.3, the Draft EIR states that for whichever water quality constituent is being analyzed, project alternatives would not cause more frequent exceedance of the Bay-Delta Plan objectives for the constituent because project facilities would be operated to objectives as implemented through D-1641. However,

since D-1641 was implemented, water quality and Delta outflow objectives have not been achieved during drought conditions and DWR and Reclamation have requested temporary urgency changes to water right requirements to relax those requirements. The EIR should demonstrate how the Project will be operated to avoid the need for future temporary urgency change petitions (TUCPs) and future violations of water quality and flow requirements. Additionally, D-1641 does not account for all possible water quality concerns in the Bay-Delta, such as harmful aquatic blooms.

Further, the modeling analysis may not fully represent the impacts to water quality if the north Delta Diversion is operated for reasons other than carriage water benefit (such as export water quality benefits) as the modeling assumes. The north Delta diversion could be utilized to a greater extent than the modeling shows, which would affect circulation of water in the Delta, increase residence time, and could lead to a degradation of water quality. In order to understand the full range of possible effects of the project, the EIR should evaluate a a scenario in which the north Delta diversion is used to the greatest extent possible similar to the analysis in Appendix 4B that assumes the opposite.

As noted in the Draft EIR, cyanobacteria blooms are a significant water quality concern in the Delta. The severity and frequency of blooms has increased in the last decade, as have the types of cyanobacteria toxins detected. The Draft EIR concludes that the project would have no significant impact on cyanobacteria blooms. The potential impact is difficult to determine however, because the analysis is incomplete. The impacts of project operations on cyanobacteria blooms were determined by an assessment of changes in bloom drivers at nine assessment locations concentrated in western and north central channels and mainstem rivers. However, the assessment locations did not encompass small and mid-sized tributary channels in the eastern, central, and southern portions of the Delta. The impacts analysis should directly examine potential impacts in small and mid-sized channels (e.g., Disappointment Slough, Turner Cut, North Fork Mokelumne and Grant Line Canal) where responses to subtle changes in water residence time, source water proportion, and water temperature are expected to have greater effects on cyanobacteria growth and persistence than in main river segments. Without assessing potential for increasing cyanobacterial harmful algal blooms (CHABs) across the entire Delta, it is difficult to determine impacts of the proposed Project operations.

Project Impacts on Aquatic Resources:

The Draft EIR uses a 5 percent threshold for determining significant impacts of the Project on fish species (Section 12.3.2 Thresholds of Significance), and states that this threshold was selected based on “best professional judgment” of the authors. The Draft EIR also considers the relative certainty of impacts (e.g., quantitative estimates based on population-level analysis vs. inferences based on changes to habitat indicators) as part of the impact conclusion. The EIR should provide scientific references supporting the use of a 5 percent threshold and the weighting of the relative certainties of impacts, particularly given the degraded status of many native fish species. Such references

should include studies (field-level or model-based) showing the relationships between the aerial extent and quality of rearing habitats and changes in population sizes of fish.

Impacts on Salmonid Species

The Draft EIR only provides qualitative discussions of the Project's potential near-field effects at the north Delta intakes on migrating juvenile salmonids. Fish mortality due to entrainment and impingement and predatory losses at the north Delta diversion intakes have not been quantitatively analyzed or incorporated in the assessment of overall project impact on salmonid species. The Project includes installation of a series of cylindrical tee screens suspended in the water column at the north Delta intakes. The Draft EIR states that the sweeping and approach velocity criteria would limit the potential for fish impingement and injury from the screen and the 1.75 mm screen opening size proposed for the north Delta intake would effectively exclude juvenile salmonids of 22 mm standard length (25 mm fork length) or greater. However, the sited case study on the operation of cylindrical tee screens and their effectiveness in reducing impacts to fish is derived from the Columbia River with a different screen configuration and greater flow than the Delta. The OBAN model for the evaluation of winter-run Chinook salmon escapement used additional five and ten percent mortality rates, as a sensitivity analysis, to account for the potential impacts at the north Delta intakes. The EIR should incorporate consideration of the potential additional mortality attributable to the operation of the north Delta intakes in the analysis of the Project impacts on aquatic species.

The Draft EIR indicates that the proposed Project would result in adverse hydrodynamic conditions, reduced available rearing habitats in the Delta, and reduced through-Delta survival of salmonid species. The proposed Project would generally decrease the survival of anadromous salmonid populations (winter-, spring-, fall- and late fall-run Chinook salmon, and steelhead) migrating through the north Delta intake reach and the Delta. The operations of the Project under the proposed operations criteria (Alternative 5) would result in significant negative population-level impacts on the populations of winter-run and spring-run Chinook salmon and steelhead exceeding the five percent threshold (Impact AQUA-2, 3, and 5). Additionally, through-Delta survival of fall-run and late fall-run Chinook salmon would also be reduced by up to three percent under Project operations (Alternative 5). As discussed above, there would also likely be additional mortality attributable to the near-field effects at the north Delta intakes, which has not been included in these estimates.

Despite evidence of significant population-level impacts, the Draft EIR concludes that Project impacts on salmonid species would be "less than significant" with mitigation measures, citing that the Compensatory Mitigation Plan (CMP) 25[11] would reduce negative hydrodynamic effects and CMP 26[12] would reduce the effects from reduced inundation of riparian/wetland benches (page 3-126). However, the Draft EIR only

[11] CMP-25: Tidal Habitat Restoration to Mitigate North Delta Hydrodynamic Effects on Chinook Salmon Juveniles

[12] CMP-26: Channel Margin Habitat Restoration for Operations Impacts on Chinook Salmon Juveniles

provides the acreages of tidal habitat and linear footages of channel margin and tidal bench habitats in Appendix 3F (Section 3F.4.3) and does not analyze the potential change in fish abundance attributable to habitat restoration (e.g., increased juvenile survival rates). The Draft EIR also does not provide supporting information on how these mitigation measures could reduce Project impacts on juvenile salmon migrating through and rearing in the Delta at levels that would compensate for the population-level decreases of adult escapement estimated based on the life cycle models (e.g., winter-run Chinook salmon population reductions under IOS and OBAN models). The EIR should provide scientific references (field-level or model-based) supporting the relationships between the aerial extent and quality of rearing habitats and changes in population sizes of various fish species.

Water diverted at the north Delta intakes would move the extent of "transitional reaches" (explained as the reach between riverine and tidal reaches; Perry et al. 2018b) further upstream, which would worsen the flow reversal in the mainstem Sacramento River. The Draft EIR cites Perry et al. (2018b) to support the restoration of tidal wetlands as a compensatory mitigation measure to dampen tidally-driven reverse flows to a level that would compensate for the reduced survival of juvenile salmonids resulting from reduced flows in the mainstem Sacramento River and increased routing into the interior Delta (Appendix 3F; Section 3F.4.3.4). However, this reference does not provide any information on the potential benefits of tidal habitat restoration on the hydrodynamics in the Sacramento River reach below the north Delta intakes. The EIR should further analyze the hydrodynamic benefits of habitat restoration as mitigation measures in relation to the population-level impacts on salmonids. In addition, given the uncertainty of the effectiveness of habitat restoration actions to mitigate impacts of the Project, a range of operating criteria should be evaluated for the Project that would avoid impacts regardless of habitat restoration actions.

Winter-Run Chinook Salmon Life Cycle Models

Three life cycle models were used to assess the population-level impacts of the Project on winter-run Chinook salmon: IOS, OBAN, and the Winter-run Chinook Salmon Life Cycle Model (Impact AQUA-2). The IOS model indicates a 9 percent reduction in adult female winter-run Chinook salmon escapement under the proposed Project. The IOS model did not consider the near-field effects of the north Delta intakes, which would be expected to make this reduction in escapement even larger. Similarly, the OBAN model results indicate a 12 percent decrease in winter-run Chinook salmon escapement under the proposed Project compared to existing conditions. When the potential near-field mortality effects are included, a 25 to 36 percent reduction in winter-run Chinook salmon escapement (with 5 to 10 percent mortality) would be indicated under OBAN. In contrast, the Winter-run Chinook Salmon Life Cycle Model results suggest higher spawner abundance (5.19 percent) under the proposed Project compared to existing conditions. The Draft EIR notes the different outcomes among the three life cycle models and suggests that the mechanisms and explanation would be investigated and reported on during the permitting process. The EIR should fully explain these contrasting results and address the near-field effects at the north Delta intakes. As

discussed above, the EIR should also consider a range of operating criteria that would reduce impacts, regardless of habitat restoration actions.

Impacts on Delta and Longfin Smelt

The Draft EIR indicates that the proposed Project would have significant negative impacts on Delta smelt and longfin smelt. The EIR indicates that the Project would decrease the populations of longfin and Delta smelt as the continued operations of South Delta export facilities and the new north Delta intakes would further reduce Delta outflows and reduce the spatial extent and quality of habitats. Project impacts on Delta smelt are considered "significant" as the operations of the north Delta intakes would worsen the conditions for the already critically low population. Operations of the Project would also result in negative population-level impacts on longfin smelt that would exceed the 5 percent threshold based on the analysis of Delta outflow and Fall Midwater Trawl (FMWT) index.

The Draft EIR concludes that impacts of the Project on Delta smelt and longfin smelt would be "less than significant" with mitigation measures, CMP-27 (Tidal Habitat Restoration for Operations Impacts on Longfin Smelt; 1,100 to 1,400 acres) and CMP-28 (Tidal Habitat Restoration for Operations Impacts on Longfin Smelt, 110 to 140 acres). However, the Draft EIR does not provide clear evidence as to how the proposed habitat restoration will reduce significant operational impacts to less than significant. The Draft EIR does not identify specific locations for tidal habitat restoration projects, nor does it evaluate any population-level benefits the restored habitat would provide to Delta smelt and longfin smelt.

Chapter 12 Aquatic Resources refers to Appendices 12B *Bay Delta Methods and Results* for aquatic resources impacts and 3F *Compensatory Mitigation Plan* for evaluation of potential benefits of tidal wetland restoration. Appendix 12B (Section 12B-19) provides methods the Draft EIR used to calculate the benefits of tidal habitat restoration mitigation for longfin and Delta smelt. The methods evaluate potential fish entrainment at the south Delta export facilities based on differing hydrologic conditions (export to inflow ratios) using the DSM2-Particle Tracking Model (PTM) runs but do not identify how the estimated entrainment of particles (assuming they represent larval and juvenile fish) are translated into population-level fish indices (e.g., FMWT longfin smelt index). The EIR should identify the potential locations and aerial extent of tidal wetland restoration projects used in CMP-27 and CMP-28 and evaluate their benefits on Delta smelt and longfin smelt populations using the best available scientific methods, including appropriately accounting for uncertainty related to the outcomes of habitat restoration, which while promising are still uncertain. Additionally, the EIR should clarify if these tidal restoration projects would be additional to those that are already in progress or proposed as part of VAs or other processes. The EIR should also evaluate

the population level effects using the Delta smelt life cycle models[13] (e.g., Polansky et al. 2021; Smith et al. 2021).

Effects of Climate Change on Hydrology

The Draft EIR uses climate change forecasts for future conditions (year 2040) that are warmer (1.8°C to 1.9°C higher temperatures) and wetter than current conditions (2.7 to 4.8 percent higher precipitation) that result in higher inflows to rim reservoirs (by 2.0 to 4.6 percent) and the Delta (by 3.4 percent) (Draft EIR Table 5-1). The Water Board's comment letter on the NOP recommended that the EIR evaluate an overall drier hydrology in the EIR consistent with Governor Newsom's "California's Water Supply Strategy, Adapting to a Hotter, Drier Future" which identifies that hotter and drier weather conditions spurred by climate change could reduce California's water supply by up to 10 percent by the year 2040. Scientific studies[14] have suggested that climate change will bring changes in precipitation patterns (less snow and more rain), higher temperatures, vegetation expansion, and longer growing seasons, which are expected to result in warmer water temperatures and lower annual streamflows than current conditions. The EIR should account for expected reductions in stream flows, including the type of conditions that occurred in 2021 when runoff was almost a million acre-feet lower than expected, resulting in significant water supply management and planning challenges.

A CalSim 3 sensitivity analysis was conducted for the Draft EIR for 2040 conditions under climate change by incorporating the 2040 Median climate projection (Appendix 30A CalSim 3 Results Sensitivity to 2040 Climate Change and Sea Level Projections). Results from the 2040 Median climate projection show generally increasing precipitation patterns in all Central Valley watersheds except the Sacramento River at Shasta and decreasing river runoffs for all watersheds compared to historical conditions centered on 1995 (1981-2010). The 2040 Median projection may represent a more realistic

[13] Polansky, L., K. B. Newman, and L. Mitchell. 2021. Improving inference for nonlinear state-space models of animal population dynamics given biased sequential life stage data. Biometrics 77:352–361. DOI: 10.1111/biom.13267.
Smith, W. E., L. Polansky, and M. L. Nobriga. 2021. Disentangling risks to an endangered fish: using a state-space life cycle model to separate natural mortality from anthropogenic losses. Can. J. Fish. Aquat. Sci. 78: 1008–1029. dx.doi.org/10.1139/cjfas-2020-0251.

[14] Albano, C. M., J. T. Abatzoglou, D. J. McEvoy, J. L. Huntington, C. G. Morton, M. D. Dettinger, and T. J. Ott. 2022. A multidataset assessment of climatic drivers and uncertainties of recent trends in evaporative demand across the continental United States. Journal of Hydrometeorology 23: 505-519. https://doi.org/10.1175/JHM-D-21-0163.1.
Berghuijs, W. R., R. A. Woods, and M. Hrachowitz. 2014. A precipitation shift from snow towards rain leads to a decrease in streamflow. Nature Climate Change 4: 583-586. doi:10.1038/nclimate2246.
Goulden, M. L., and R. C. Bales. 2014. Mountain runoff vulnerability to increased evapotranspiration with vegetation expansion. PNAS 111: 14071-14075.
Milly, P. C. D., and K. A. Dunne. 2020. Colorado River flow dwindles as warming-driven loss of reflective snow energizes evaporation. Science. DOI: 10.1126/science.aay9187.
Udall, B., and J. Overpeck. 2017. The twenty-first century Colorado River hot drought and implications for the future, Water Resour. Res., 53, 2404–2418, doi:10.1002/2016WR019638.

assumption of future hydrologic conditions under climate change based on the available scientific literature that should also be evaluated.

Modeling and Analysis

The modeling and analysis in the Draft EIR is based on CalSim 3 simulations. While CalSim 3 may be an appropriate tool, it is a new model that has not been publicly reviewed, nor fully documented. Water Board staff recognize the challenges in documenting and validating such a complex model, but because the model and the assumptions are not thoroughly documented, it is difficult to fully review the validity of the modeling and assumptions. The Draft EIR should demonstrate that the model reasonably represents the system that is being analyzed. Specifically, CalSim 3 modeling assumptions should be more clearly stated for each alternative. The Draft EIR includes two revised appendices, 5A-B Attachments 3 and 5, that describe detailed assumptions and results for existing conditions and the no project alternatives. However, no such appendices contain assumptions and results for the proposed alternative or other alternatives. In addition to the detailed appendices for each alternative, the EIR should include a table that clearly compares assumptions for each alternative similar to what was provided during the California WaterFix Project water right proceeding.

The water year types in CalSim 3 do not match the historical water year types even though the model assumes historical hydrology. The resulting CalSim 3 water year types include more wetter year types and fewer drier year types than occurred over the simulation period historically. This affects how the results are presented throughout the Draft EIR and when regulatory requirements such as D-1641 requirements are imposed in the model. This portion of CalSim 3 should be fully documented, and a sensitivity analysis should be conducted on the existing conditions scenario that uses historical water year types to help reviewers understand the effect of using simulated water year types instead of historical water year types.

Closing

The Water Boards appreciate the opportunity to provide comments on the Draft EIR for the Project. By participating in the process in an advisory capacity, the Water Boards hope to ensure that a broad range of alternatives is evaluated, and the potential impacts of all the alternatives are fully disclosed. While the Water Boards can provide information that will help guide the Project toward a successful completion of the process, the Water Boards cannot make a prior commitment to the outcome of any regulatory approval by the Water Boards. The State Water Board acts in an adjudicative capacity when it acts on a water right application, change petition, or other water right approval that may be required for or requested in connection with a proposed project. The State Water Board must be an impartial decision-maker, avoiding bias, prejudice, or interest in any adjudicative proceedings conducted in accordance with the State Water Board's regulatory approvals. Accordingly, Water

Board staff will not act as advocates for the project or any particular alternatives during the Delta Conveyance Project processes.

In closing, the Water Boards appreciate the opportunity to continue to participate in an advisory capacity regarding the Water Boards' regulatory and informational requirements. If you have any questions, please contact me at Diane.Riddle@waterboards.ca.gov.

Attachments: Table 1 - Additional Water Board Comments on Draft EIR for the Delta Conveyance Project

State Water Board Comment Letter on the Notice of Preparation of Environmental Impact Report for the Delta Conveyance Project, dated 15 April 2020

cc: Central Valley Regional Water Quality Control Board (via email):
Patrick Pulupa
Adam Laputz
Janis Cooke
Stephanie Tadlock

State Clearinghouse Unit, Governor's Office of Planning and Research, Sacramento (via email)