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March 16, 2017

Ms. Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, CA 95814-0100

RE: Recirculated Draft Substitute Environmental Document in Support of Potential Changes to the Water Quality Control Plan for the San Francisco Bay-Sacramento/San Joaquin Delta Estuary: San Joaquin River Flows and Southern Delta Water Quality

Dear Ms. Townsend:

Thank you for the opportunity to comment on the *Substitute Environmental Document in Support of Potential Changes to the Water Quality Control Plan for the San Francisco Bay-Sacramento/San Joaquin Delta Estuary: San Joaquin River Flows and Southern Delta Water Quality*, hereafter referred to as the "SED". We understand that the State Water Resources Control Board (State Water Board) is proposing amendments to the *Water Quality Control Plan for the San Francisco Bay-Sacramento/San Joaquin Delta Estuary* (Bay-Delta Plan), the first phase of which will address San Joaquin River flow objectives for the protection of fish and wildlife and southern Delta salinity objectives for the protection of agriculture.

Overall, the Delta Stewardship Council (Council) finds the SED to be a well-written and well-researched document that recognizes the connections among flows, native fish populations, and water quality in the southern Delta. The general scientific approach outlined in the SED is sound, but we recommend clarification of: 1) how flows will be managed to best achieve more functional, natural flow characteristics; 2) the use of flow and non-flow measures to meet yet-to-be determined biological objectives; 3) adaptive management measures and timelines; and, 4) the governance structure for achieving stated goals and objectives. Properly implemented, the proposed changes to the Bay-Delta Plan have the potential to contribute toward Delta Plan policies and recommendations, including: Delta Plan policy **G P1** (Coequal Goals, Best Available Science, and Adaptive Management (23 California Code of Regulations section 5002)), Delta Plan policy **ER P1** (Delta Flow Objectives (23 California Code of Regulations section 5005)), Delta Plan recommendation **ER R1** (Update Delta Flow Objectives), and the state's coequal goals for the Delta (Water Code section 85054).

Council staff and the Delta Independent Science Board (Delta ISB) commented on the prior version of the SED, posted Dec. 31, 2012. Council staff appreciates that many of their comments, and those of the Delta ISB, have been considered in development of the current SED. The proposed changes to the Bay-Delta Plan include provisions for adaptive implementation (implementing adaptive management through experimentation), and the potential for alternative

water management and restoration agreements that would allow for more flexible implementation of the amended Bay-Delta Plan requirements.

Comments on the Proposed Phase I Bay-Delta Plan Amendments

The Council recognizes that the revision of flow and water quality objectives is difficult and controversial, and that the State Water Board has challenging questions to answer in balancing the allocation of water among beneficial uses. The State Water Board needs to consider agricultural, urban, and ecosystem beneficial uses of a finite water supply. As the SED recognizes, this water supply will be further constrained by the additional demands imposed by the Sustainable Groundwater Management Act. However, amendment of the Bay-Delta Plan is critically important for the achievement of the state's coequal goals, and the Delta Plan recognizes this importance by calling for the expedited completion of this work. The Delta Reform Act and the Delta Plan call for best available science to guide decision making, and this is especially important given the uncertainty surrounding establishment of flow objectives for the Lower San Joaquin River (LSJR). We submit the following comments for your consideration.

1. Unimpaired Flow and a More Natural, Functional Hydrograph

The Delta Plan calls for more natural, functional flows to contribute to achievement of the coequal goals. The Council recognizes that this does not mean we can expect the same flows as those that supported ecosystem functions before the Delta was substantially altered and transformed. However, flows that more closely resemble the natural timing, frequency, duration, volume, and rate of change of flow for a region's climate will best support native aquatic communities. This is well supported by the best currently available science, and we appreciate that it is also recognized in the SED.[1,2,3,4]

Unimpaired flows, the approach proposed in the SED, are not the same as "more natural, functional flows" as described in the Council's Delta Plan.[5] Unimpaired flow, the flow that would be expected if reservoirs were removed but the contemporary watershed and current land uses remained, differs from natural flow, runoff that would have occurred had the landscape and waterways remained unaltered. This is because natural floodplains and native vegetation would likely have changed the amount and timing of surface runoff[6]. However, unimpaired flow is a closer approximation of what is thought to be historical natural flow than current flow objectives for the San Joaquin River and its tributaries. As the SED indicates and the proposed changes to the Water Quality Control Plan allow, flow objectives based on unimpaired flow could be implemented in ways that more effectively achieve desired ecosystem functions than strict adherence to percentage of unimpaired flow. The science community is unlikely to coalesce around a single unimpaired flow value as the "right" value for a given river system, but there is a body of evidence indicating that an unimpaired flow methodology can be effective. The Delta ISB previously raised the importance of effective adaptive management and stated that management of flows at 35% of unimpaired flow appears to be the lower limit for potential improvements to environmental

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1 Yarnell, S. M., Petts, G. E., Schmidt, J. C., Whipple, A. A., Beller, E. E., Dahm, C. N., Goodwin, P. and Viers, J. H. (2015). Functional Flows in Modified Riverscapes: Hydrographs, Habitats and Opportunities. BioScience, 65(10):963-972. Retrieved January 2016, from: https://watershed.ucdavis.edu/files/biblio/ BioScience-2015-Yarnell-biosci_biv102.pdf.

2 SED, Chapter 3, p. 3.

3 Delta Independent Science Board comment letter to the State Water Resources Control Board dated March 29, 2013 regarding December 2012 Substitute Environmental Document on San Joaquin River Flows.

4 Kiernan, J. D., Moyle, P. B. and Crain, P. K. (2012). Restoring native fish assemblages to a regulated California stream using the natural flow regime concept. *Ecological Applications*, 22(5):1472-1482.

5 Delta Stewardship Council 2013, The Delta Plan, p. 134

6 Department of Water Resources March 2016 (DRAFT), Estimates of Natural and Unimpaired Flows for the Central Valley of California: Water Years 1922-2014.

conditions in the LSJR.[7] Flow volume and how it is managed (sculpted and shaped) are both important. The SED should ensure that the level of unimpaired flows ultimately selected as a starting point can be adaptively managed to meet the to-be-identified biological objectives.

The State Water Board's proposal to set flows based on a specific percentage of unimpaired flow can be consistent with the concept of more natural, functional flows if these flows are appropriately sculpted, shaped, and managed in order to achieve stated objectives. The calculation of unimpaired flows provides a framework from which to consider possible flow requirements, but the use of water negotiated and allocated using this technique needs to be effectively utilized through careful consideration of the more natural functional flow needs of native fish. The SED recognizes the importance of functional flows, but defers the details of how they will be implemented. For example, exactly how a given volume or "block" of water would be shaped or sculpted during the February-June period is unclear. We understand that development of this detail is proposed to be done through the Stanislaus, Tuolumne, and Merced Rivers Working Group (STM Working Group), but it would be helpful to be assured that the STM Working Group will consider variables like the timing, duration, frequency, rate of change, and volumes of flow. It will also be important to link these sculpted and shaped flows to the geomorphology of each river system and to key life history attributes of native fish species. We additionally recommend clarifying what role, if any, the STM Working Group will play in real-time operations. The State Water Board should fully consider how adaptive implementation and use of a given block of water can best be used to optimize ecosystem functions.

The SED also considers potential changes to unimpaired flows and water temperature outside of the February-June period. This period of time is especially important given projected climate change effects of higher temperatures and greater amounts of future precipitation falling as rain instead of snow. Flashier fall and winter flows and lower summer base flows are very likely with a changing climate and warmer temperatures. The future flow conditions from July through January and the late summer and early fall temperature conditions deserve greater attention in the SED.

2. Importance of Non-flow Measures

A successful Bay-Delta Plan amendment should include both flow and non-flow actions. Because the LSJR ecosystem is substantially modified from its pre-20th century state, providing greater unimpaired flows without non-flow, ecosystem restoration actions may be inadequate and inefficient for the recovery of some native species. Non-flow actions include floodplain and riparian zone restoration, placement of fish screens, and predatory fish control.[8] In particular, floodplain connectivity has been largely lost along the LSJR tributaries and restoration of floodplain habitat along these tributaries will likely provide significant benefits for native fish. Currently, it is difficult to evaluate potential outcomes of proposed non-flow measures, because it is not currently known what measures will be used, where these measures would be implemented, and what the biological goals will be. We support a mix of non-flow and more functional, natural flow approaches for native fish species recovery in these catchments.

To the extent implementation of a combination of flow and non-flow measures is only feasible through voluntary negotiated settlements, we strongly support that approach as long as the outcomes are in keeping with the furtherance of the state's coequal goals.

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[7] Delta Independent Science Board comment letter to the State Water Resources Control Board dated March 29, 2013 regarding December 2012 Substitute Environmental Document on San Joaquin River Flows.
[8] SED, Chapter 3, p. 3-18.

3. Adaptive Management

Adaptive management is called for in the Delta Reform Act and is prescribed by the Delta Plan for ecosystem restoration and water management covered actions within the Delta (23 California Code of Regulations section 5002(b)(4)). Although the SED includes an area upstream of the Delta, the Delta Plan's adaptive management approach is relevant to the entire project area and would improve outcomes if appropriately implemented. The Council supports utilization of a clearly described adaptive management methodology in determining the most effective ways to manage flows and non-flow measures.[9]

The State Water Board should clarify the anticipated adaptive measures that could be implemented as part of adaptive management. The SED states that "Implementation of the unimpaired flow requirement for February through June will require the development of information and specific measures to achieve the flow objectives and to monitor and evaluate compliance" and says that the proposed measures would be developed in consultation with the Delta Science Program (DSP).

- What measures are anticipated and how are these expected to be utilized in adaptive implementation?
- How do these measures link to LSJR flow objectives and goals, including the biological goals that will be developed subsequent to approval of the amendment to the Bay-Delta Plan?

Adaptive management should also address non-flow measures because many of these measures, such as better connecting rivers and floodplains in reaches where feasible, attempting to reduce predation, and improving spawning habitat, are amenable to adaptive management experimentation. It may be useful to consider a decision tree to help with identifying adaptive management actions to take depending on resulting outcomes from the various flow and non-flow actions.

We recommend the State Water Board clarify the timeline for management actions prior to implementation. The SED states that the "...STM Working Group, or State Water Board staff as necessary, will, in consultation with the DSP, develop proposed procedures for allowing the adaptive adjustments to the February through June flow requirements...".[10] The SED should make clear the time step(s) covered by these procedures and whether adjustments are real-time, seasonal, or annual. For example, will the adaptive schedules identified in the "annual adaptive operations plans"[11] be subject to management of real time operations? If so, how does "adaptive implementation" fit in? Will this be performed during real-time operations, or only through adaptation of subsequent annual operation plans?

4. Governance Structure

The SED provides considerable background information. However, a few details related to implementation of the proposed amendments remain unclear. In particular, we suggest that the State Water Board clarify: 1) the details of governance structures, and 2) the expected role, where applicable, of the DSP or Delta ISB.

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9 SED, Appendix K, p. 29-31.
10 SED, Appendix K, p. 34.
11 SED, Appendix K, p. 32.

The STM Working Group is a central component of the proposed Bay-Delta Plan amendment. As a collaborative stakeholder-government agency group, the proposed STM Working Group would be responsible for providing input for a variety of tasks regarding adaptive management and implementation. These include setting biological goals, developing and implementing monitoring, tracking progress towards those goals, and making recommendations for the adaptive implementation of flows. However, based on the description in the document, the exact composition of the STM Working Group is not fully determined, and it is unclear how decisions would be made.[12] We encourage the inclusion of scientific representatives in the STM Working Group, and we recommend that the State Water Board clarify how decision making will be carried out when consensus cannot be achieved.

We propose to work with the State Water Board to clarify the roles of the DSP and the Delta ISB. The SED notes that the State Water Board will carry out planning activities "… with the support of the DSP and the Delta ISB to assure that Plan updates are based on the best available science."[13] It is our understanding that this support would be similar to DSP and Delta ISB current activities. As one example, the mission of the DSP is to provide the best possible unbiased scientific information for decision-making, and the DSP regularly consults on adaptive management, supports focused scientific workshops and symposia, and coordinates independent scientific reviews. As a second example, the Delta ISB provides independent oversight of scientific research, monitoring, and assessment programs and conducts high level scientific reviews, such as their reviews of California WaterFix environmental documents, the 2012 draft San Joaquin SED, flows and fishes in the Sacramento-San Joaquin Delta, and adaptive management in the Delta. We ask that these roles be made clear in the SED.

Once again, we commend you on the progress made to date, and look forward to the final version of the SED. We hope you find these comments helpful. If you need any clarification regarding our comments, we encourage you to contact Deputy Executive Officer Cassandra Enos-Nobriga at cassandra.enos@deltacouncil.ca.gov or (916) 445-0258.

Sincerely,

Jessica Pearson
Executive Officer
Delta Stewardship Council

Cliff Dahm
Delta Lead Scientist
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[12] SED, Appendix K, p. 30.
[13] SED, Appendix K, p. 7.