Friends of the ESTUARY
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THE SAN FRANCISCO BAY-DELTA ESTUARY

Ms. Felicia Marcus, Chair
c/o Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, CA 95812-2000

March 15, 2017

Subject: Support for Restoration of Freshwater Flows from the San Joaquin River and its Tributaries to the Bay-Delta Estuary

Dear Chair Marcus:

Friends of the San Francisco Estuary (Friends) appreciates the opportunity to review and comment on the State Water Resources Control Board's (State Board's) *Recirculated Draft Substitute Environmental Document in Support of Potential Changes to the Water Quality Control Plan for the Bay Delta: San Joaquin River Flows and Southern Delta Water Quality* (Draft SED), released September 15, 2016. Friends is grateful for the State Board's recognition that the San Francisco Bay-Delta Estuary is in ecological crisis. By recommending improvements to flows on the lower San Joaquin, Merced, Stanislaus, and Tuolumne rivers, the Draft SED acknowledges the strong scientific consensus that both the timing and quantity of current flows on the San Joaquin River and its three major tributaries are inadequate for many threatened and endangered and/or commercially and recreationally valuable species of fish and wildlife. Friends would like to offer the following comments as the State Board moves forward with finalizing the SED and implementing a program with robust outcomes for all beneficial uses:

Commendations

1. The unimpaired flow (UF) approach improves hydrological conditions for native fish species such as salmon.

By more closely mimicking the natural variability in hydrology of the rivers, the unimpaired flow approach offers greater protection to native fish and wildlife and the river ecosystem than the existing fixed monthly flow. As the Delta Independent Science Board noted in its 2012 review of this approach, "unimpaired flow comes closer to approximating natural flow, and it does so more transparently" (Delta Independent Science Board 2012). This approach has been widely studied and provides significant ecological benefits for native species (Fleenor et al. 2010, Poff et al. 2009, Poff et al. 1997, Richter et al. 2011). The Draft SED proposes an adaptively managed range of 30-50% of unimpaired flow for February-June, with a recommended starting point of 40% UF, which will increase flows on the Merced, Tuolumne, and lower San Joaquin rivers. The State

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Board has proposed using an adaptively managed minimum 7-day running average to achieve these percent UF targets, which would, if implemented, increase the variability of flows during the February-June window. Increased quantity and variability of flow are both essential to restoring fish and wildlife populations on these rivers.

2. The inclusion of non-flow measures as a component of voluntary agreements acknowledges the significance of non-flow factors in recovery of threatened and endangered populations of fish and wildlife, while remaining within the State Board's regulatory authority over flows.

The SED's recommendation of non-flow actions to assist with recovery of threatened and endangered fish and wildlife is both appropriate and welcome, although it should be noted that non-flow measures do not take the place of flow objectives and, in many cases, depend on sufficient flow for successful implementation. Non-flow measures such as habitat restoration, gravel augmentation, water temperature management, and fish passage improvements can provide benefits to salmonids if flow is sufficient. In some cases, non-flow measures have been proposed to take the place of the proposed flow objectives in the Draft SED; however, this strategy is unlikely to be effective at either current or marginally increased flow levels in the lower San Joaquin River and its tributaries (Rosenfield 2016). Furthermore, flows provide ecological functions, such as providing olfactory cues to migrating salmon, transport of sediment, and recharge of local aquifers, which cannot be replicated with non-flow measures. Some non-flow measures in particular rely on sufficient flows for successful implementation; for instance, habitat restoration through reconnecting historical or stranded floodplains requires enough river flow to inundate the restored floodplain and provide habitat benefits. An "all-of-the-above" approach that includes both flow and connected non-flow measures can ensure more robust outcomes of all recovery efforts on these river systems.

3. Adaptive management is a necessary component to provide the flexibility for standards to reflect changing conditions and understanding of the complexities of the rivers and the Bay-Delta system.

Monitoring results and changing management have always been a practice of science. As Fleenor et al. note in their 2010 analysis of flow prescriptions to sustain fish populations in the Delta (Fleenor et al. 2010), the establishment of any flow prescription will necessitate certain working hypotheses regarding flow function and benefits. Climate change is expected to affect the timing and variability of runoff over the next few decades, with unknown impacts to fish, wildlife, river ecosystems, and water supply. Critically dry water years may create conflicts between the various beneficial uses of water, or even conflicts within a particular use of water, as recent temperature management failures on the Sacramento River have demonstrated. Scientific studies of the San Joaquin River system may produce knowledge of previously underappreciated or overlooked functions that demand changes to the management of flows. Adaptive management will be necessary to keep pace with changing conditions and knowledge, and if successful, may result in fewer updates to the Water Quality Control Plan. As noted below, however, safeguards are needed to ensure that adaptive management is not used to avoid leaving sufficient water in the system to protect and sustain fish populations and ecological functions.

Concerns

1. The recommended unimpaired flow range and starting point (LSJR Alternative 3) falls short of the flow recommendations of federal and state fish and wildlife agencies for recovery of native fish populations, and may limit efficacy of non-flow measures.

The preferred alternative in the Draft SED, Lower San Joaquin River Alternative 3 (LSJR Alternative 3) recommends an adaptively managed range of 30-50% UF with a starting point of 40% UF. Depending on the adaptive management approach used, LSJR Alternative 3 will result in modest improvements to flows on the tributaries and the lower San Joaquin River. This range does not reflect the level of flow recommended by federal and state fish and wildlife agencies for recovery of native fish populations, and as will be discussed further below, could be managed in a way that negates the benefits of an unimpaired flow approach.

The United States Environmental Protection Agency (EPA), National Marine Fisheries Service (NMFS), United States Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW), and the State Board itself have indicated that significant flow augmentation and improvements to timing are needed to recover Central Valley salmon populations. Minimum recommendations by these agencies are all higher than the 40% recommended starting point proposed in the LSJR Alternative 3. NMFS, in its comment letter on the original draft SED issued in 2012, stated, "The preferred alternative (35 percent of unimpaired flow)* is not well justified in the SED and is not adequate to achieve a viable salmonid population in the San Joaquin River system. We recommend the Board begin at 45 percent of unimpaired flow" (NMFS 2013). United States Department of the Interior (USDOI) noted in its comment letter on the original draft SED that the preferred alternative of 35% of unimpaired flow would never provide a total volume of water sufficient to achieve mandated salmon doubling targets under any water year type (USDOI 2013). CDFW stated that "substantial evidence demonstrates that approximately 50%-60% unimpaired flow is the minimum necessary to reestablish and sustain fish and wildlife beneficial uses" in its comment letter on the original draft SED, citing the NMFS 2009 Biological Opinion that "unimpaired flows must be more than 40% to achieve the limited biological purpose of avoiding species jeopardy" on the Stanislaus River (CDFW 2013). This indicates that LSJR Alternative 3 will not achieve the minimum standard of avoiding species jeopardy on the Stanislaus River, and in fact, the State Board's obligations to protect the public trust extend beyond avoiding species jeopardy.

Finally, in its comment letter on the current Draft SED, EPA makes a case for a higher range of unimpaired flow, stating,

> "Higher percent UF alternatives such as 40-60% result in better rearing temperature conditions and floodplain inundation benefits. The SED shows that lethal temperatures would be reached for salmon in September on the Stanislaus, Tuolumne, and Merced Rivers, and in August, September and October in the lower San Joaquin River in an average year under the 40% UF alternative. Despite forecasted improvements at the 40% UF target, multiple scientific studies indicate flows higher than 40% of UF may be needed to meet the Salmon Protection Objective and protect the beneficial use. The proposed 40% UF does not achieve CDFW flow recommendations to protect fall-run Chinook salmon or the FWS recommended flow targets necessary to meet the Salmon Protection Objective" (EPA 2016).

A slow decline toward extinction still ends with extinction. All fish and wildlife agencies, including the State Board's own 2010 report determining the flow criteria for public trust resources, have agreed that higher flows—beyond the 40% UF recommended in LSJR Alternative 3—are necessary to the recovery of declining salmon populations in the San Joaquin River system. The State Board appears to anticipate that the preferred alternative will improve conditions incrementally on the three tributaries, but the current status quo conditions correspond

to extremely poor levels of Chinook salmon survival on these tributaries in all but the wettest years. Since continued decline of one or more populations of Central Valley salmon does not constitute an adequate balancing of beneficial uses, the State Board must revisit the recommended alternative and adjust the starting range of unimpaired flow accordingly, or select LSJR Alternative 4 (range of 50-60% unimpaired flow with a starting point of 60%) as the preferred alternative.

2. The Draft SED imposes artificial seasonal and geographic restrictions that reduce the benefits provided by improved flows in the lower San Joaquin River, the three tributaries, and the south Delta.

In restricting recommended flow objectives to the February-June period, the State Board puts certain stages of fall-run Chinook salmon, spring-run Chinook salmon, and steelhead at risk for further declines. As the EPA has noted twice, first in its 2013 comment letter and more recently in its 2016 comment letter, native migratory fish are present in the San Joaquin River in most months of the year, not just February –June (EPA 2013, EPA 2016). In fact, the State Board's analysis for 40% UF shows that under the recommended LSJR Alternative 3, all three tributaries would experience lethal temperatures for salmonids in September, while the lower San Joaquin River would experience lethal temperatures in August, September, and October in an average year. Although the adaptive management program includes the flexibility of a 'block of water' that can help meet biological objectives during other times of the year such as the fall, it is difficult to understand how, in dry or critically dry years, the recommended LSJR Alternative 3 can possibly provide sufficiently protective flows during the February-June period and also a surplus block of water that can be used to protect native coldwater species during the fall period. A higher range, such as LSJR Alternative 4, has greater potential to provide the improvements in flow amount and variability during the critical February-June period while also preserving a block of water that can shape the hydrograph and provide temperature control during other times of the year.

The elimination in the Draft SED of the upper San Joaquin River, from Friant Dam to the confluence with the Merced River, is another artificial restriction that serves to reduce the benefits of improved freshwater flows to the south Delta and Bay-Delta water quality. As Contra Costa County notes in its 2016 comment letter on the Draft SED (Contra Costa County 2016), the upper San Joaquin watershed from Friant Dam to the Merced River contributes approximately 30% of the total unimpaired flow to the lower San Joaquin River. The Draft SED justifies exclusion of this segment of the San Joaquin River with the explanation, made in the Executive Summary, that the San Joaquin River upstream of the confluence with the Merced River is not currently a salmon-bearing stream. However, this current state is due to the delayed full implementation of the San Joaquin River Restoration Program, which will produce restoration flows, among other restoration efforts. The State Board's assumption, as stated in Appendix K, is that the San Joaquin River Restoration Program will "restore and maintain fish in good condition" on this segment of the San Joaquin River, under the San Joaquin River settlement agreement, and therefore does not need to be considered as part of the Draft SED at this time.

Excluding the Friant to Merced segment of the San Joaquin River from the Draft SED does not comport with the watershed approach espoused by the State Board. More importantly, excluding this segment of the San Joaquin River impacts the estimate of flow conditions at Vernalis and therefore the south Delta, as noted by the EPA in its 2013 comment letter: "The State Board's approach results in less than 35% UF at the downstream point of Vernalis because no flow requirements are proposed for the upper San Joaquin River, which contributes a significant

amount of the unimpaired flow but less of the actual observed flow" (EPA 2013). The recommended 40% UF starting point for the tributaries and lower San Joaquin River translates into less than 40% UF at Vernalis when the upper San Joaquin River is excluded. This is problematic in terms of assuring that outflows at Vernalis are sufficient to provide the migratory corridor needed by salmonids. Despite the assurance of the San Joaquin River Restoration Program agreement, the State Board should include the Friant to Merced segment of the San Joaquin River in the Draft SED.

3. In an effort to achieve greater management flexibility, adaptive management of flows must not negate the ecological and biological benefits of the percent-unimpaired flow approach in terms of volume and variability. The adaptive management program should provide reliable safeguards to ensure that program goals are met, particularly in the decision-making procedures of the STM Working Group.

   a. Block of Water

   In the course of the five public meetings on the Draft SED held between November 29, 2016 and January 3, 2017, extensive discussion took place on the management of a "block of water," within the unimpaired flow range, which could be allocated throughout the year as needed to meet fish and wildlife and other beneficial uses. This "block of water" as described in Appendix K is intended to enable greater management flexibility and help shape flows to meet certain biological objectives. However, this approach could have the unintended effect of trading flexibility for reduced benefits of higher flows and the greater hydrologic variability offered by the approach in which river flow rates reflect a percentage of UF based on a 7-day running average. This concern is particularly relevant at the low range of recommended LSJR Alternative 3. For example, for LSJR Alternative 3, if 40% UF is allocated to a tributary in a given year, the actual flow in the river during February-June may be as low as 30% UF, in order for the additional 10% to be shifted to serve a specific function, such as fall temperature management or pulse flows. However, that leaves only 30% UF in the rivers during the February-June regulatory window, which is far below the amount that fish and wildlife agencies recommend, as stated above.

   As noted by Drs. Johnson and Sturrock at the State Board's public meeting on November 29, San Joaquin River system salmon are uniquely adapted to high flow variability, and their studies show that both increased flow magnitude and variability improve juvenile salmon abundance and resilience (Johnson and Sturrock 2016). Because the recommended LSJR Alternative 3 offers such a modest improvement in flow magnitude (and potentially no improvement for the Stanislaus River), the use of the "block of water" concept has limited benefit, and is likely to produce as many conflicts in meeting biological goals as it is intended to resolve. The "block of water" approach, in fact, offers yet another argument for increasing the recommended range beyond 30-50%, or selecting LSJR Alternative 4 as the recommended alternative.

   b. 7-day Running Average

   The management measures described in the Draft SED also specifically counteract the benefit of hydrologic variability offered by the unimpaired flow approach, as they drop the 7-day running average approach to generating daily flow rates. Chapter 3 of the Draft SED states, "Without adaptive implementation, flow must be managed such that it tracks the daily unimpaired flow percentage based on a running average of *no more than* 7 days" (emphasis added; Chapter 3 p. 3-11). But the Draft SED proposes that adaptive implementation methods require maintenance of the recommended percent unimpaired flow based on a *minimum* 7-day

running average. As Donald Ratcliff of the United States Fish and Wildlife Service (USFWS) demonstrated to the State Board on January 3, 2017, even the shift from a 3-day running average to a 7-day running average has a significant effect on the hydrograph by smoothing out flow variability (Ratcliff 2017). It appears from the adaptive implementation described in Chapter 3 that the running average could be calculated at a 30-day interval or even longer. These longer intervals completely negate the natural variability – so important to Chinook salmon and other resources – embedded in the use of the 7-day running average as a maximum. The 7-day running average should be preserved as a maximum to provide a safeguard to adaptive implementation; at a minimum, the State Board should provide clear guidance regarding how, when, and to what ends the 7-day running average approach may be supplanted by an engineered or "shaped" hydrograph.

c. Connection from San Joaquin River to Pacific Ocean

One of the most important functions of the higher flow range recommended in the Draft SED is to provide olfactory and physical cues for migrating salmonids. However, the EPA has expressed concern in both its 2013 and 2016 comment letters that without a sufficiently protective range, outflows will not connect to the Delta, San Francisco Bay, and the ocean to provide a migratory signal and corridor for salmon (EPA 2013, EPA 2016). This includes providing sufficient attraction flows in the fall as well as spring. Again, a higher range like that analyzed in LSJR Alternative 4 could ensure the flexibility to provide attraction flows for both fall-run and spring-run Chinook salmon.

d. Stanislaus, Tuolumne, and Merced (STM) Working Group

Effective adaptive implementation necessitates the formation of a working group to make timely decisions. The STM Working Group should include members of environmental interest groups in equal proportion to the representation of other interest groups (e.g., water districts). In addition, adaptive implementation methods 2 and 3 require only one member of the STM Working Group to recommend a change, which then would be approved by the Executive Director of the State Board. This decision-making process leaves too much discretion in the hands of individual working group members. All adaptive implementation methods should require the approval of more than one member, such as a member of the water user groups, a member of the environmental interest groups, and a member from the fish and wildlife agencies.

e. Improved Safeguards for Achieving Recovery of Listed Species

The five public meetings convened by the State Board included many suggestions for ways to bolster the current adaptive implementation program, in addition to those offered above. Specific biological objectives or defined quantitative targets, such as the salmon doubling objective of the existing Water Quality Control Plan, already exist and could provide the accountability needed to make the Draft SED achieve recovery of listed salmonids. These targets must be combined with clear timeline for attainment. A comprehensive monitoring and assessment framework, linked to adaptive implementation and biological outcomes, will also close the feedback loop by providing timely data on the effectiveness of the Draft SED.

f. Recent Failures of Real-Time Drought Management

The Draft SED should offer a path forward in managing the San Joaquin River basin that learns from the challenges of the recent drought. Real-time drought management in the past few years highlighted some of the shortcomings of the current Water Quality Control Plan. The Draft SED should offer enough safeguards to ensure that adaptive management doesn't result in relaxation of intended environmental protections in dry and critically dry years,

provided that human health and safety is not an issue and that the impact of necessary responses to severe drought conditions is shared by all beneficial uses.

Finally, restoring the ecosystems of the San Joaquin River system is both feasible and essential to an extensive part of California and the west coast. Recovering Chinook salmon runs on the San Joaquin River and its tributaries, as intended by state and federal law, would help revive the struggling ocean fisheries of California, Oregon, and Washington, revitalizing the commercial and recreational fishing industry throughout Central and Northern California and beyond. Improved river and estuarine functions can provide benefits beyond the commercial and recreational fishing industries, such as reducing the frequency of toxic algal blooms, which threaten water-contact recreation and public health. For millions in California and beyond, the health of these rivers, the Bay-Delta Estuary, and fish and wildlife have a value that can be given an economic estimate in the form of non-use or passive use values, as noted in Chapter 20 of the Draft SED: "Oftentimes, estimates of non-use values can total in the hundreds of millions of dollars or more" (Chapter 20 p. 20-70). The protection of endangered native species from extinction, however, may not be quantifiable in economic terms when it comes to keystone species or species with significant iconic or symbolic status like the Chinook salmon.

Innovations in urban and agricultural water supply and use are emerging daily, and can provide effective means of extending the limited water available in California for human uses. For our declining native fish and wildlife, however, solutions are limited to those that foster greater ecosystem health. Improvements in the timing and quantity of freshwater flows are a known driver in riverine and estuarine health, and therefore must be prioritized in planning for the future.

The Draft SED offers an opportunity for significant benefits to the ecosystems of the lower San Joaquin River, its three major tributaries, and the San Francisco Bay-Delta Estuary. It also sets the stage for the levels of protection in subsequent phases of the Water Quality Control Plan. We urge you to address the deficiencies in the proposed plan and work with all parties to implement a program that will enable a real recovery of these great rivers in a reasonable timeframe. Such a task is feasible, essential, and urgent. Thank you for the opportunity to comment on this process.

Sincerely,

Mitch Avalon
Board President

Cc: Jeanine Townsend
Boardmember D'Adamo
Boardmember Doduc
Boardmember Moore

References

California Department of Fish and Wildlife. 2013. Comments regarding 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, dated March 28.

Contra Costa County. 2016. Initial Comments on Draft Revised SED on proposed updates to WQCP for Bay-Delta Estuary, dated December 14.

Delta Independent Science Board. 2012. Letter to State Water Resources Control Board RE: Flow Criteria that use Percent of Unimpaired Flow, dated May 22.

Fleenor, William E., William A. Bennett, Peter B. Moyle, and Jay R. Lund. 2010. *On Developing Prescriptions for Freshwater Flows to Sustain Desirable Fishes in the Sacramento-San Joaquin Delta*. Davis: University of California, Davis.

Johnson, Rachel and Anna Sturrock. 2016. "Salmon life history portfolios in a regulated river." Presentation to the State Water Resources Control Board, November 29.

National Marine Fisheries Service. 2013. Comment letter on the State Water Resources Control Board's Draft Substitute Environmental Document (SED), dated March 28.

Poff, N. Leroy, Brian D. Richter, Angela H. Arthington, Stuart E. Bunn, Robert J. Naiman, Eloise Kendy, Mike Acreman, Colin Apse, Brian P. Bledsoe, Mary C. Freeman, James Henriksen, Robert B. Jacobson, Jonathan G. Kennen, David M. Merritt, Jay H. O'Keefe, Julian D. Olden, Kevin Rogers, Rebecca E. Tharme, and Andrew Warner. 2009. "The ecological limits of hydrologic alteration (ELOHA): a new framework for developing regional environmental flow standards." *Freshwater Biology*, doi:10.1111/j.1365-2427.2009.02204.x.

Poff, N. Leroy, J. David Allan, Mark B. Bain, James R. Karr, Karen L. Prestegaard, Brian D. Richter, Richard E. Sparks, and Julie C. Stromberg. 1997. "The Natural Flow Regime: a paradigm for river conservation and restoration." *BioScience*, Vol. 47, No. 11: 769-784.

Ratcliff, Donald. 2017. "U.S. Fish and Wildlife Service Bay-Delta Plan Phase 1 Revised SED Review." Presentation to the State Water Resources Control Board, January 3.

Richter, B. D., M. M. Davis, C. Apse, and C. Konrad. 2011. "Short Communication: A Presumptive Standard for Environmental Flow Protection." *River Research and Applications*, doi: 10.1002/rra.1511.

Rosenfield, Jon. 2016. "Biological Effects of Flows Proposed Water Quality Standards for the Lower San Joaquin River and Tributaries." Presentation to the State Water Resources Control Board, November 29.

State Water Resources Control Board. 2016. 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, September..

United States Environmental Protection Agency. 2013. Comment letter on Bay-Delta Water Quality Control Plan: Phase 1, dated March 28.

United State Department of the Interior. 2013. Comment letter on the State Water Resources Control Board's Draft Substitute Environmental Document (SED), dated March 29.