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Felicia Marcus, Co-Hearing Officer and State Water Board Chair
Didi D'Adamo, Board Member
State Water Resources Control Board
1001 I Street
Sacramento, California 94596

Sent via email to *CWFhearing@waterboards.ca.gov*
cc: Electronic Service, Service list dated March 26, 2018

RE: San Francisco Baykeeper – WaterFix Policy Statement.

Dear Hearing Officers Doduc and Marcus, and Board Member D'Adamo,

Thank you very much for the opportunity to appear before you and give oral comment on Thursday, February 8, 2018, and for the opportunity to submit this written policy statement. As you know, the California WaterFix is one of the most ambitious project proposals in California's rich history of ambitious water proposals. With a price tag that could reach $60 billion when financing costs, interest, administration, research, operation, and maintenance fees are added to the initial estimate of $17 billion in construction costs, WaterFix represents a dauting financial commitment for the people of California, and that potential commitment in turn requires the utmost care from those—such as the State Water Resources Control Board (SWRCB)—who are tasked with reviewing the project.

San Francisco Baykeeper (Baykeeper) and our more than 5,000 members and supporters are deeply concerned about the health of both San Francisco Bay and the Sacramento-San Joaquin River Delta (Bay-Delta). The Bay-Delta ecosystem is already in crisis and existing regulatory protections are insufficient to protect the struggling species and communities that rely on a healthy Bay. In times of drought, Temporary Urgency Change Petitions are granted with devastating effects such as nearly extinguishing winter salmon runs. Longfin and Delta smelt remain at record low abundance.

It is not alarmist to say that the Delta-wide ecosystem—and, by extension, San Francisco Bay—is in collapse and that its damaged condition may spell doom for many important species and habitats. Scientific evidence has shown that the Delta is starving for freshwater, with repercussions for the entire estuary. While there are no quick or easy solutions to increase freshwater flows, what is clear is that the Governor's current proposal, known as WaterFix, would authorize further water diversions from this already crippled system without first establishing a path to recovery and sustainability. At the very least, the massive expenditure required to build the twin tunnels would cement the status quo of a

steadily worsening Bay-Delta ecosystem into place for the foreseeable future. The tunnels would harm the rivers, harm the Delta, and harm San Francisco Bay.

Baykeeper has submitted multiple comments on the likely water quality and ecological impacts of WaterFix. Here are some of the main problem areas:

- WaterFix trades high quality Sacramento River water in the Delta for lower quality San Joaquin water, increasing harmful concentrations of selenium, pesticides, nutrients and other contaminants. This places in jeopardy the communities and species that rely upon Delta water.

- Harmful algal blooms in the Delta, such as microcystin, are already increasing in strength and frequency. A more northerly extraction point will further increase the duration and intensity of these blooms.

- WaterFix would accelerate salinity intrusion into the Delta, further reducing brackish habitat, increasing habitat for invasive species, and threatening water supplies.

- Reduced freshwater flows would inhibit the ability of migrating salmon to quickly navigate through the Delta and Bay to the ocean, increasing the likelihood of predation and reducing already struggling salmon populations.

- WaterFix will worsen existing selenium problems; this threatens federally-listed green sturgeon and diving ducks, since selenium concentrations in Suisun Bay are directly associated with freshwater flow.

- Waterfix will reduce sediment transport to San Francisco Bay, threatening existing wetlands and beaches as well as reducing the ability of wetlands to keep up with sea level rise and protect the Bay Area from future flooding.

Thus, WaterFix will make matters worse. Salmon survival through the Delta will be worse, according to the National Marine Fisheries Service and many other reputable scientists. Longfin smelt abundance will be worse, according to the State of California's own scientists. These fish, Delta smelt, and many others will be harmed by WaterFix impacts which include reduced water quality, reduced turbidity, increased salinity, and reduced Delta outflow. And the permit application submitted by WaterFix would allow the continued operation of South Delta pumps in most months, eliminating any supposed environmental benefits from a more northerly diversion point. These known impacts are bad enough, but WaterFix has not been adequately studied and most impacts are only projected in the near-term. For instance, some of the project's modeling only looks at impacts through 2025, prior to the expected completion of WaterFix. Long term impacts, such as those that might result from climate change and sea level rise, are ignored.

WaterFix is the latest iteration of California's obsession with an engineered solution to balance the relative abundance of water in the northern part of the state with the perceived lack of water in the south. Beginning in the 1940s and 50s, the State became consumed with developing water diversion projects in and around the Delta. In the 1980s California voters defeated a proposal for a peripheral canal. The latest iteration of this quest is the twin tunnels proposed under WaterFix.

Conditions Have Seriously Degraded in the Delta and Northern San Francisco Bay.

The combination of historic wetland destruction to support farming and cities, on-going urban and agricultural pollution, and heavily diverted water resources have created conditions that have seriously degraded the ecosystems of the Delta and northern San Francisco Bay (i.e. Suisun Bay), especially over the last three decades. As a result, there are negative consequences for recreation, tourism, ecology, farming, and the availability of water exports. The health of the upper Bay-Delta is now in poor condition, a conclusion supported by the overwhelming majority of scientists in publications such as the 2015 State of the Estuary report.[1] The indicators of this poor condition include struggling populations of Delta smelt and other fish, both native and non-native, phytoplankton, algal blooms, a lack of unimpaired and floodplain flows, and an overabundance of stagnant water.

Recent surveys for the Delta smelt suggest the species is at or near extinction. Throughout the 2016 fall surveys for Delta smelt, only 8 individuals were found, while in 2014 and 2015 fall season surveys, only 9 and 7 individual smelt, respectively, were caught. In 2017 there were only 2 individuals caught.

Historic lows and declining population trends are reflected in all other monitored fish species, both native and non-native, including the economically important sport fish, striped bass.[2] Native fish populations in Suisun Bay have dropped by 64%. In the Central and North Delta, native fish abundance has dropped by 87% over the same time span.[3]

Native species can no longer be found at all in some areas of the Delta. In Suisun Bay, 59% of fish are non-native. A healthy ecosystem should contain a diverse fish population dominated by native species, as demonstrated by those areas of the Bay, like the Central Bay, which is heavily influenced by ocean conditions. The upper Bay-Delta does not display these characteristics, and available evidence shows the problem is getting worse.[4]

In the Delta, production of phytoplankton—which form the bottom of the food web—ranked in the lowest 15% of the world's estuaries due to a number of factors, including insufficient habitat and low freshwater flows.[5] Drought and low-flow conditions have also caused never-before seen blooms of toxic blue-green algae, or cyanobacteria, known to be harmful both to wildlife and humans.[6]

A major cause for all of these issues is that, in recent years, spring Bay inflows have averaged only 44% of unimpaired flows.[7] Criteria adopted by the SWRCB explain that in order to protect resources in the Delta and preserve a naturally variable system to which native fish species are adapted, winter and spring flows through the Delta and into the Bay should be at least 75% of natural, unimpaired flows.[8] Related to the overall flow issue is the lack of floodplain flows. Since the early 1990s, flood flow conditions have been poor 68% of the time. This means that flows do not reach floodplains needed for primary productivity and fish rearing.[9] While freshwater wetlands have been reduced by 98%, open-water area has increased by 63%, creating more lagoon-like conditions in the Delta. These stagnant conditions are conducive to harmful algal blooms, propagation of invasive species, and the concentration of harmful pollutants.[10]

Scientists began observing declining fish populations soon after completion of the Central Valley and State Water projects, and over the past decade those fish populations have reached a crisis point as several species are nearing extinction. The downward population trends are directly linked to water diversions out of the Delta and to the resulting habitat loss. As a result of these diversions, there is little opportunity for flows and fish to reach floodplains, where essential nutrients and sources of food are found.

California Waterfix's Twin Tunnels Proposal Will Harm the Bay-Delta Ecosystem.

The alleged benefits of WaterFix—reductions in entrainment and reverse flows, for instance—are highly speculative. While WaterFix proposes to reduce current entrainment, there are no operational actions included with the tunnels proposal that would guarantee such reduced entrainment. Furthermore, the proposal would introduce another opportunity for fish entrainment at the mouths of the new tunnels, and doubts remain about the effectiveness of the advanced, but very long, fish screens that have been proposed.[11] That means that WaterFix could result in increased fish entrainment, and at the very least improvements in entrainment should not be treated as certain. Moreover, the National Marine Fisheries Service's Biological Opinion for WaterFix and the California Department of Fish & Wildlife's Incidental Take Permit for WaterFix note several other negative impacts for fish species, including elimination of critical Delta smelt habitat, continuation of projected Longfin Smelt population declines, and increased salmon mortality. These projected impacts indicate that WaterFix is overall bad for fish because it maintains the existing inadequate levels of outflow.[12]

Furthermore, the long-term ecologically harmful consequences arising from any project to re-plumb the Delta would likely outweigh any purported benefit. The consequences of removing flows from a northern diversion point on the Sacramento River include ecosystem-scale effects, such as increased salinity intrusion throughout the Bay-Delta, reduced flows available to help juvenile salmon reach the ocean fast enough to avoid

predation, and unknown consequences to the Bay-Delta when high quality Sacramento River water is replaced by low quality South Delta and San Joaquin River water.

Additionally, downstream impacts are likely to affect portions of San Francisco Bay. Reduced high quality flows would increase Bay concentrations of selenium, which is already present in the upper-Bay at levels toxic to sturgeon and diving ducks during drought conditions. Likewise, sediment transport into the Bay-Delta would be reduced, limiting the ability of shoreline beaches and wetlands to replenish themselves or combat sea level rise. Finally, reduced higher quality flows would increase the likelihood and magnitude of toxic algal blooms such as microcystin, which has already been documented in the upper San Francisco Bay in recent years.

By taking high quality Sacramento River water from a new northern point of diversion before it reaches the Delta, less clean freshwater will be available to flush out and dilute harmful pollutants, such as selenium and pesticides, in the upper San Francisco Bay and Delta. Reductions in flows through the Bay-Delta will also make it harder for juvenile salmon to reach the ocean. In addition, freshwater reductions will create more stagnant conditions conducive to the proliferation of harmful algal blooms and invasive species. So relative to the highly speculative outcome that salmon and smelt entrainment will be reduced, WaterFix will likely commit California to degrading the Bay-Delta ecosystem further, and also harm the economy that depends on it.

Four unique populations of Chinook Salmon, as well as Central Valley Steelhead, depend on the Sacramento River for their survival. Two of the Chinook and the Steelhead are listed under endangered state and/or federal endangered species acts. The construction and operation of WaterFix would significantly reduce the survival of juvenile Chinook Salmon and Steelhead migrating from the Sacramento River and tributaries through the Delta. WaterFix would further reduce already dangerously low through-Delta survival of migrating juvenile salmon compared to conditions today. And the models and analysis used to evaluate impacts in the WaterFix's environmental documentation fail to evaluate both current threats to Chinook and Steelhead and the impacts that WaterFix will have. Even so, the NMFS biological opinion concludes that the adverse effects of the new WaterFix diversions exceed any benefits, resulting in lower overall survival.

Longfin Smelt abundance and productivity will also be significantly negatively impacted by the reduced winter-spring Delta outflow proposed by WaterFix.[13] Outflow criteria from March through May would not maintain current levels of outflow. There is a direct relationship between Longfin Smelt abundance and outflow, so any reduction in outflow would have a direct impact on Longfin Smelt populations.[14] Furthermore, entrainment of juvenile Longfin Smelt may increase dramatically under WaterFix operations, including at the proposed northern diversion points. The WaterFix's environmental

documents underestimate these impacts and proposed mitigation measures are insufficient to make up even for acknowledged population impacts.

Delta Smelt are critically endangered, and planned WaterFix operations will negatively affect the availability and suitability of rearing habitat while failing to substantially reduce the risk of entrainment. Delta outflow is tied to Delta Smelt survival rates—decreased outflow leads to increased salinity and limits access to critical habitat[15]—yet WaterFix proposes to reduce outflow in winter, spring, and summer. Entrainment risk under WaterFix is not proposed to be reduced in drier years, exactly the years when entrainment stress has the greatest potential to trigger catastrophic population declines.[16] And Delta Smelt prefer higher turbidity,[17] while WaterFix is predicted to reduce turbidity and increase harmful algal blooms. These factors all show that WaterFix will have an overall significantly negative impact on Delta Smelt.

Decreased flows and decreased turbidity will negatively impact a wide variety of creatures, both native and otherwise, even beyond the specific examples given above. Turbidity is vital to maintain valuable mudflat and tidal marsh habitats, reduce harmful algal blooms, and protect native fish from predation. Reduced sediment supply to the Bay-Delta estuary, which could be has high as a 10% reduction from current levels, greatly harms the Bay-Delta's resilience in the face of climate change and sea level rise. Thus, WaterFix operations are expected to reduce habitat availability, degrade what habitat remains for native fish and wildlife, increase harmful algal blooms, and impair food web productivity, all the while contributing to the erosion of critical infrastructure all around San Francisco Bay.

There Are Better Alternatives than WaterFix.

For more than 25 years, Baykeeper has been the premiere watchdog of the water quality of San Francisco Bay. Today, the California WaterFix is one of the greatest threats to the health of the Bay, its wildlife, and the communities that rely on a thriving Bay ecosystem. WaterFix is not a necessity, and Baykeeper urges the SWRCB to consider the wide range of promising alternatives suggested by the many commenters to these WaterFix proceedings.[18]

Baykeeper believes that a wider range of alternatives must be considered in any future iteration of a Delta "fix." Had a wider range of alternatives been considered in the current round of environmental documents, a pivot toward a more sustainable option might now have been possible. Unfortunately, all of the alternatives assessed in the current environmental documents center around two large tunnels to meet a significant proportion of California's agricultural and urban needs. This means a meaningful fix for the Delta ecosystem is likely years away.

The current heavy-handed management style is not the best solution to California's water supply issues and the ongoing ecosystem collapse in the Bay-Delta. Instead, a portfolio of science-based actions should be evaluated to stabilize the Bay-Delta ecosystem and prevent fish extinctions while permitting sustainable water exports. There is movement toward such a portfolio that the SWRCB must nurture and protect, including the development of flow standards for the San Joaquin and Sacramento River watersheds, shovel-ready plans for large-scale habitat restoration in the North Delta Habitat Arc, the modernization and funding of levee maintenance programs, enhanced groundwater storage, conservation and enhanced urban water supplies, and a proposed reduction in tunnel scope to a single smaller tunnel.

San Francisco Bay and the Sacramento-San Joaquin River Delta are inextricably linked. Changes to one water body will inevitably affect the other. In the near term, there are promising signs for implementation of habitat restoration plans under EcoRestore and improved flows in the San Joaquin River through increased flow standards. These are critical steps toward restoring the Delta. Yet no one solution will result in a magical fix for the Delta's complex issues. Many in the water world, including San Francisco Baykeeper and its partners, eye WaterFix and its purported benefits with great skepticism. There are better, more responsible options on the table to help us improve California's water future.

Conclusion.

Respectfully, the SWRCB cannot in good conscience find that WaterFix does not "unreasonably affect fish and wildlife or recreational uses of water, or other public trust resources," without an adequate project description that accurately describes what the final project will look like and what impacts it will have. You do not have that in the WaterFix proposal currently before you.

Thank you for the opportunity to address these important issues.

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Staff Attorney
San Francisco Baykeeper

[1] San Francisco Estuary Partnership (SFEP). 2015. The State of the Estuary 2015. San Francisco Estuary Partnership, Oakland, CA.

[2] While striped bass have shown some rebound in 2017, possibly due to increased precipitation and consequent freshwater flows, overall population trends are still negative and of significant concern. See California Department of Fish and Wildlife. Fall Midwater Trawl indices for age-0 striped bass (Morone saxatilis), delta smelt (Hypomesus transpacificus), longfin smelt (Spirinchus thaleichthys), American shad (Alosa sapidissima),splittail (Pogonichthys

macrolepidotus), and threadfin shad (Dorosoma petenense) from 1967-2016. Available at http://www.dfg.ca.gov/delta/data/fmwt/indices.asp.
[3] SFEP, *supra* note 1.
[4] *Id*.
[5] Cloern, J. E., S. Foster, and A. Kleckner. 2014. Phytoplankton Primary Production in the World's Estuarine-Coastal Ecosystems. Biogeosciences 11:2477-2501.
[6] Dahm, C.N., A.E. Parker, A.E. Adelson, M.A. Christman, and B.A. Bergamaschi, 2016. Nutrient Dynamics of the Delta: Effects on Primary Producers. San Francisco Estuary and Watershed Science, 14(4).
[7] SFEP, *supra* note 1.
[8] State Water Resources Control Board. 2010. Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem.
[9] Swanson, C. 2015. Ecological Processes – Flood Events Indicators Technical Appendix, State of the San Francisco Estuary 2015.
[10] San Francisco Estuary Institute-Aquatic Science Center (SFEI-ASC). 2014. A Delta Transformed: Ecological Functions, Spatial Metrics, and Landscape Change in the Sacramento-San Joaquin Delta. Richmond, CA.
[11] Simenstad, C,, J. Van Sickle, N, Monsen, E, Peebles, G,T, Ruggerone, and H. Gosnell. 2016. Independent Review Panel Report for the 2016 California WaterFix Aquatic Science Peer Review.
[12] National Marine Fisheries Service. 2017. Biological Opinion for the California Water Fix; California Department of Fish & Wildlife. 2017. Incidental Take Permit No. 2081-2016-055-03: Construction and Operation of Dual Conveyance Facilities of the State Water Project (California WaterFix).
[13] CDFW ITP, *supra* note 12.
[14] Rosenfield, J. A. and R. D. Baxter. 2007. Population dynamics and distribution patterns of longfin smelt in the San Francisco estuary. Transactions of the American Fisheries Society 136:1577-1592; Nobriga, M.L., and J.A. Rosenfield. 2016. Population dynamics of an estuarine forage fish: disaggregating forces driving long-term decline of longfin smelt in California's San Francisco Estuary. Transactions of the American Fisheries Society 145: 44-58.
[15] USFWS. 2016a. Why flow is a necessary element of Delta Smelt habitat. U.S. Fish and Wildlife Service, San Francisco Bay-Delta Fish and Wildlife Office. 6/29/16.
[16] Kimmerer, Wim J. 2008. Losses of Sacramento River Chinook Salmon and Delta Smelt (*Hypomesus trans-pacificus*) to Entrainment in Water Diversions in the Sacramento-San Joaquin Delta. San Francisco Estuary and Watershed Science. Vol. 6, Issue 2 (June), Article 2.
[17] Mahardja, B., M.J. Young, B. Schreier, T. Sommer. 2017. Understanding imperfect detection in a San Francisco Estuary long-term larval and juvenile fish monitoring programme. Fish Manage. Ecol. 2017:488-503.
[18] The testimony of Doug Obegi, in particular, concisely presents many of these alternatives. *See* WaterFix Part II Exhibit NRDC-1, Testimony of Doug Obegi.