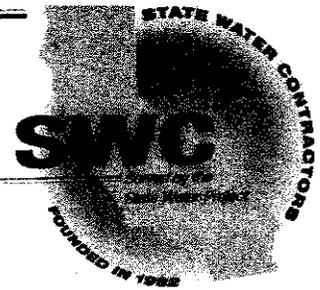
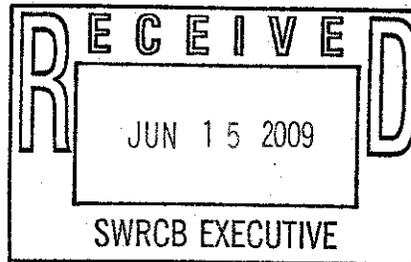


June 15, 2009

Ms. Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812



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General Manager
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Re: State Water Contractors' Comments on the 2009 Periodic Review Staff Report

Dear Ms. Townsend:

Introduction

The State Water Contractors (SWC)¹ has reviewed the State Water Board staff's Report for the upcoming periodic review of the 2006 Bay-Delta water quality control plan. Quite frankly, we are very disappointed by its tone, its incomplete and often one-sided depiction of the state of the science, its lack of balance regarding matters the Board is statutorily required to consider in developing water quality objectives, and its recommendation that ammonia and other toxics issues be excluded from the process. In summary, for the reasons outlined below, the SWC urges the Board to (a) approve periodic review of the topics recommended by its staff, (b) add to the topics to be reviewed those related to ammonia and other toxics, and (c) explicitly not adopt, accept, or in any manner approve the text of the Staff Report, as such an action could be interpreted as prejudging the state of the science and the proper balance among competing beneficial uses before all the information has been provided for your consideration.

The Board Should Not Equate Water Quality Control Planning With ESA Compliance

The Staff Report contains numerous references to the ongoing Bay-Delta-related ESA processes and to the federal court litigation on the Delta smelt and salmonid biological opinions. While it is certainly appropriate to apprise the Board of the on-going administrative and court proceedings that involve these issues, it is not appropriate to imply, as the Staff Report does, that limitations imposed upon the SWP and CVP through the ESA provide an equivalent foundation for amending the WQCP.

¹ The SWC is a non-profit association of 27 public agencies from Northern, Central, and Southern California that purchase water under contract from the California State Water Project (SWP). The SWP is the state's largest water delivery system, and collectively, members of the SWC deliver SWP water to more than 25 million residents throughout the state and more than 750,000 acres of highly productive agricultural land.

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Although it is never mentioned in the Staff Report, California's Porter-Cologne Act includes substantially different standards for the adoption or amendment of a WQCP than those applicable to ESA determinations. Among other things, the Legislature makes it plain in the Porter-Cologne Act that water quality control plans result from a *balancing* process and that the objectives included as a part of such plans are to ensure the "reasonable protection of beneficial uses." Water Code Section 13241. To this end, the Legislature specifically enumerates the factors that are to be considered in establishing or amending water quality objectives and includes the following: "Past, present and probable future beneficial uses of water", "economic considerations", and "the need for developing housing within the region". This statutory authority follows the California Constitution's requirement that the waters of the State must be put to reasonable and beneficial use to the fullest extent possible in the interests of the public. As Judge Racanelli stated in comprehensively describing the Board's role in developing and implementing water quality objectives, the guiding policy—the "touchstone"—is the public interest." None of these factors are elements of the ESA from which the delta smelt and salmon biological opinions were recently developed. Yet, the Staff Report never once mentions the concept of *balance* in its entire 51 pages.

The Staff Report's apparent embrace of the ESA requirements as surrogates for balanced water quality objectives is contrary to Porter-Cologne Act and the Racanelli opinion and ignores the water costs of the recent Delta smelt and salmonid biological opinions. DWR has determined that, collectively, the two biological opinions will reduce combined SWP and CVP exports to the farms and millions Californians who rely upon them by an average of more than 2,000,000 acre feet as compared to D-1641. That is not obviously compatible with the balancing requirements of the Porter-Cologne Act.

The Board needs to follow the public interest balancing and reasonableness dictates of the water quality planning statutes, and recognize that the ESA agencies are not subject to the same legal mandates related to the balancing of beneficial uses as is the Board. We urge the Board to avoid conflating water quality objectives and ESA actions promulgated ostensibly to avoid jeopardy to listed species. Their underlying statutory frameworks cannot be reconciled to support such an approach.

Topics To Be Considered

In general, the SWC does not dispute that each of the topics suggested by Board staff warrant review. A great deal of new, and sometimes quite conflicting, science has been developed because the pelagic organism decline ("POD") has prompted a flurry of activity. The SWC believes, however, that the Staff Report is inconsistent when selecting some topics for Board consideration while rejecting others. For example, at page 22, in discussing the Delta Cross Channel, the Report states that updated information should become available during the basin planning process and, therefore concludes: "Given likely availability of new information and the importance of the DCC gate to overall Delta water quality conditions, staff recommends the State Water Board review the DCC gate objective in the Bay Delta Plan." In contrast, the Report later recommends that the ammonia issues not be reviewed at this time because studies are ongoing and final data are not yet available. Yet, the fact is that new information on ammonia will be available this year on a time schedule similar to that for the Delta Cross Channel.

“Given the likely availability of new information and the importance of” ammonia “to overall Delta water quality conditions” the SWC urges the Board to reject the staff recommendation and add consideration of establishing ammonia objectives to the list of topics. The evidence that ammonia and ammonium concentrations are having a detrimental impact on aquatic species is compelling and should not be so readily dismissed as was done in the Staff Report.

The conclusions in the Staff Report for the ammonia objectives relate only to the direct toxicity effects of ammonia that are covered under US EPA’s 1999 Update of Ambient Water Quality Criteria for Ammonia. In so doing, it misses the mark. The focus should also be on the apparently detrimental affect that ammonium concentrations are having on the food web. There is significant evidence that ammonium is a limiting factor in spring algae bloom formation in areas under the jurisdiction of the State Board and the WQCP. The evidence strongly suggests that ammonium at levels far lower than the protective levels specified in the US EPA’s 1999 criteria are impairing important spring diatom production in Central, San Pablo and Suisun Bay, critical rearing habitat for delta smelt, longfin smelt, and other species of concern (Dugdale, *et al.* 2007). Further investigations will only clarify how far upstream the effect is observed. That information should be available during the basin plan amendment process.

Instead of recognizing the relationship between ammonium and algal community composition, the Staff Report minimizes the role of ammonium in harmful algal blooms by citing a study by Lehman, *et al.* 2008, that found ambient nutrient concentration and ratios are of secondary importance to *microcystis* and *microcystin* variation in the San Francisco Estuary. The Staff Report fails to mention that the study by Lehman came to this conclusion because nutrient concentrations were consistently an order of magnitude higher than limiting values throughout the water column. In contrast to the Staff Report description, the recent CALFED Science Ammonia Expert Panel describes the role of ammonium in harmful blooms as follows:

Because the dominant cyanobacterial genus in the Delta (*Microcystis*) does not fix N_2 , these increasingly more common and extensive cyanobacterial blooms indicate sufficient and possibly excessive N loading to the Delta. Increases in NH_4^+ concentrations specifically might exacerbate this situation. Compared to NO_3^- and N_2 (via fixation) as N sources, NH_4^+ produces the highest growth and primary production rates for *microcystis aeruginosa* and other cyanobacteria (*Aphanizomenon flos-aquae* and *Anabaena flosaquae*) in laboratory studies (Ward and Wetzel 1980). (Meyer, *et al.*, 2009, p. 4.)

It is well known that the Sacramento and San Joaquin rivers already regularly exceed the U.S. EPA nutrient criteria for rivers and streams, Ecoregion I (Central Valley) reference conditions of 0.047 mg/L and 0.31 mg/L, respectively (U.S EPA, 2001). The reference condition is meant to represent the nutrient concentrations in minimally impacted water bodies. The evidence suggests that this nutrient loading is having impacts on the food web. There is extensive literature that relates excessive anthropogenic nutrient loading to detrimental shifts in algal community composition and growth rates. For example, Glibert, *et al.*, 2008, states:

Documented impacts of nutrient pollution in the U.S. and worldwide have included habitat change, decreases in biodiversity, and increases in hypoxia and [Harmful Algal Blooms] (e.g., Nixon 1995, Bricker et al. 1999, NRC 2000, Burkholder 2001, Cloern 2001, Rabalais 2002, Anderson et al. 2002, Breitbart 2002, Glibert et al. 2005a, b).

The Staff Report also fails to acknowledge the research addressing the potential for chronic ammonia toxicity. Research by Werner, *et al.* 2009 suggests that the Sacramento River immediately below the Sacramento Regional County Sanitation District ("Sanitation District") Wastewater Treatment Plant ("SRWTP") already exceeds the potentially safe chronic levels for delta smelt. Werner, *et al.*, 2009, states that:

The US EPA (1999) reports mean acute-to-chronic ammonia/ium ratios for warm water fish range between 2.7 (channel catfish, *Ictalurus punctatus*) and 10.9 (flathead minnow, *P. promelas*). Cold water species such as rainbow trout, with acute ammonia/ium sensitivity similar to delta smelt, have a ratio between 14.6 and 23.5, respectively (US EPA, 1999; Passell *et al.*, 2007). If a safety factor of 23.5 were applied to acute ammonia effect concentrations for delta smelt larvae (ammonia 96-h LC₅₀ : 0.15 mg/L) then the resulting concentration would be 0.0064 mg/L ammonia. Reported unionized ammonia concentrations in the Sacramento River immediately below the SRWTP are 0.0085 +/- 0.005 and would exceed potentially chronic safe values for delta smelt. During January-June 2008, maximum ammonia concentrations measured down river at Hood and Grand Island (POD site 711) were 0.019 mg/L and 0.021 mg/L, respectively (Werner, I., UCD-ATL, unpublished data). The chronic values derived above are similar to those reported by other studies. Dodds and Welch (2000) suggest that chronic effects of ammonia on fish may occur at concentrations as low as 0.005 mg/L.

The ongoing research is also addressing whether multiple stressors increase susceptibility to ammonia toxicity. The existing science suggests that actively swimming and unfed fish may be several times more sensitive to ambient un-ionized ammonia levels than laboratory exposures indicate. (Eddy 2005)

In light of the existing evidence that ammonia and ammonium concentrations are having an impact on aquatic species, the SWC believes that the State Board should have an active role in developing ammonia criteria. While the SWC truly appreciates the consideration the ammonia/ium issue is receiving from the Regional Board, it believes the State Board should be similarly engaged. The science linking ammonia/ium to potentially harmful effects on aquatic species is developing rapidly. As noted above, a significant amount of new information on ammonia/ium is expected to be available by the end of summer 2009.

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The SWC would also point out that failing to take ammonia impacts into account during the upcoming basin plan review will make it much more difficult, if not impossible, for the Board to decide, on balance, whether the public interest calls for trying to mask or dilute the impacts of ammonia by mandating flows from the CVP and SWP or whether more stringent water quality objectives and discharge controls better balances the use of Delta waters for the competing beneficial uses. This is also true for toxics other than ammonia.

There are several recent studies available that provide evidence of significant toxicity in the Delta. The Staff Report does not mention any fish kills such as the one that occurred on the San Joaquin River west of Stockton in 2008 following a storm event. In addition, Lavado et al. 2009 found estrogenic activity in water from Lower Napa River, Lower Sacramento River and Carquinez Strait near Benicia. Brander et al. 2008 observed choriogenin induction in male silversides from Suisun Marsh. Riordan et al. 2008 reported endocrine disruption in male fathead minnows following in-situ exposures below the Sacramento WTP. And, Johnson (pers. comm. with USFWS) reported vitellogenin induction in 100% of male splittail from Suisun Bay.

The Central Valley Regional Water Board's own Irrigated Lands Regulatory Program has detected significant occurrence of toxicity in Central Valley waterways (see Table 1 Attachment). While many of the sample locations of the Irrigated Lands Regulatory Program are small sloughs and agricultural drainage canals, according to NMFS 2008, "Juvenile salmonids rely upon a variety of non-main channel habitats that are critical to rearing. All listed salmonids use shallow, low flow habitats at some point in their life cycle" (p. 229). In addition, "Diverse, abundant communities of invertebrates (many of which are salmonid prey items) also populate these habitats and, in part, are responsible for juvenile salmonids reliance on off-channel habitats" (p 236).

All of this evidence and the Board's need to have a complete picture of the multiple stressors impacting the Delta fishery call for inclusion in the basin planning process of ammonia and other toxics. The SWC, therefore requests that these topics be included as additions to the staff recommended topics.

The Board Should Adopt Only the Issues Recommended in the Staff Report, Along with Those Suggested by the SWC, But Not Otherwise Approve the Staff Report

As noted at the beginning of this letter, the SWC strongly believes that the text of the Staff Report presents an incomplete and, as a result, a misleading picture of what are recognized as established scientific facts. The express purpose of the water quality objective hearings that the Board is about to begin is to establish a comprehensive record of the best available science upon which the Board can make its critical decisions. The Staff Report's selective summary of the staff's estimation of the state of the science at this point is incompatible with that record making process and should be removed from the Report. The SWC may provide the Board with a redline of the Staff Report prior to the July 7, 2009, hearing to further demonstrate our concerns in this respect. At this time, however, we will present a couple of key examples.

At page 19, the Staff Report states "recent studies provide additional evidence of the likely role of SWP and CVP export pumping in the continued decline of several Delta fish species." That same paragraph continues: "estimates of the population of delta smelt and losses at the SWP and CVP export facilities indicate that a significant fraction of the population may be lost due to export pumping," citing Kimmerer 2008.

What is not included in the Staff Report is Kimmerer 2008's statement that "no effect of export flow on subsequent midwater trawl abundance is evident." Further, the POD synthesis report, at page 19, states:

"Manly and Chatkowski ...(2006) used log-linear modeling to evaluate environmental factors that may have affected long-term trends in the Fall Midwater Trawl abundance index of Delta smelt. They found that monthly or semi-monthly measures of exports or Old and Middle rivers flow had a statistically significant effect on delta smelt abundance; however, individually they explained a small portion (no more than a few percent) of the variability in the fall abundance index of delta smelt across the entire survey area and time period. Hence, there are other factors that dominate the long-term trends of delta smelt fall abundance. Similarly, Kimmerer et al. (2001) estimated that entrainment of young striped bass were sometimes very high (up to 99%), but they did not find evidence of that entrainment losses were a major driver of long-term striped bass population dynamics."

The Staff Report fails to recognize the difference between entrainment percentages and the population level effects of such entrainment. Similarly, the Staff Report's E/I ratio discussion neglects to mention the minor fractional population level effect of the pumps, including the authors of all the cited papers that are quoted as purporting to show the harmful effects of exports. The scientists are struggling to find answers, but a review of the synthesis report shows carefully chosen wording to the effect that most of what is out there today are hypotheses looking to be verified or rejected. The Staff Report, too often, improperly implies that these hypotheses are established facts, which they are not.

Another example of overstatement appears a page 24: "SWP and CVP exports have been identified as a *major* contributing factor in the decline of Delta smelt and other pelagic species" (Italics added.) A reference for this statement is Kimmerer 2008. In fact what Kimmerer stated was "manipulating export flow (and, to some extent, inflow) is the only means to influence the abundance of delta smelt that is both feasible and supported by the current body of evidence, *even though export effects are relatively small.*" (Italics added.)

The Staff Report, unfortunately, is replete with statements that imply an established fact when only a hypothesis, at best, is at play. This is also true with respect to Bennett's "big mama" theory of Delta smelt reproduction for which there is as yet no written report in existence and the new fall X2 hypothesis of a correlation to smelt abundance that has been significantly questioned in the broader scientific community. The Staff Report lacks fundamental balance, evidenced by repeated failures to recite or even allude to the full scope of the ongoing scientific debate.

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Therefore, the SWC believes that any action by the Board to endorse the textual materials would prejudice the upcoming hearings and workshops. Further, such an endorsement or other approval is not needed at this time, as simply approving the scope of the issues to be considered is sufficient.

Conclusion

The SWC is disappointed that it felt compelled to provide a somewhat negative response to the Board's staff work product, as we, as always, want to work with the Board and its staff to develop the best possible balanced approach to water quality planning for the Delta. We look forward to the hearings that will follow and will provide more detailed data on the current science and the impacts of water quality proposals on the important beneficial uses of SWP water.

Very Truly Yours,

A handwritten signature in black ink, appearing to read 'T. Erlewine', written in a cursive style.

Terry Erlewine
General Manager

Attachment

Table 1. Observed Significant Toxicity

Species tested	Number of sites with \geq 1 toxic sample	Number of sites tested	Percent of sites with at least one toxic
<i>Pimephales promelas</i>	26	186	14.0%
<i>Ceriodaphnia dubia</i>	69	185	37.3%
<i>Selenastrum capricornutum</i>	60	157	38.2%
<i>Hyalella azteca</i>	54	139	38.8%
All species combined	119	201	59.2%

Table compiled from data within CVRWQCB, 2007.