CONTRA COSTA
WATER DISTRICT

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June 10, 2011

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

Subject: Scoping Comments on Southern Delta Salinity and San Joaquin River Flow Objectives

Dear Ms. Townsend and Members of the Board:

Contra Costa Water District (CCWD) appreciates the opportunity to comment on the revised notice of preparation and to provide input for the upcoming Substitute Environmental Document (SED) for the review of the 2006 Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary focused on the southern Delta salinity and San Joaquin River flow objectives and the program of implementation for those objectives. CCWD is providing these comments to ensure a complete document is produced. There are important biological ramifications of the proposed water quality objectives that have not been raised to date that should be included in the SED. The panel discussion presented by federal and state fishery agencies on June 6, 2011 at the scoping meeting focused entirely on the importance of establishing flow objectives to protect salmonids. None of the agencies discussed the potential impacts to salmonids that the proposed water quality objective changes could have. Degrading water quality in the southern Delta could be detrimental to salmon populations for a variety of reasons.

- **INCREASED SALINITY LEVELS IN THE SOUTHERN DELTA COULD DISRUPT SMOLT OUTMIGRATION**
  As part of the smolt transformation process, when salmon begin to undergo the physical and behavioral changes necessary to reach and thrive in the ocean, they begin showing a preference for saline waters[1]. San Joaquin River salinity (generally as much as 1 mS/cm, with chloride levels over 150 mg/l) is generally much higher than Sacramento River salinity (about 0.15 mS/cm with chloride levels around 10 mg/l). It has been shown that as smolts encounter increasing

[1] Iwata, M. 1995. Downstream migratory behavior of salmonids and its relationship with cortisol and thyroid hormones: A review. *Aquaculture* 135: 131-139.

salinity, their behavior becomes less passive and their movement becomes more directed towards the ocean[2]. Salmon attempting to follow the salinity gradient to the ocean may be lead inland because of high San Joaquin salinity and saline discharges (ag and urban) within the Delta. Salmon that may mistakenly swim towards the southern Delta rather than towards the ocean are likely to have a high mortality rate due to increased physiological stress or increased entrainment at the unscreened export facilities. Weakening water quality objectives could degrade water quality in the southern Delta and strengthen this 'reverse' salinity gradient, potentially jeopardizing successful smolt outmigration on both the Sacramento and San Joaquin systems.

- **EXPOSURE TO HIGH SALINITY DURING SPAWNING MIGRATION COULD RESULT IN INCREASED MORTALITY**

  Salmon re-entering the estuary to spawn undergo extensive physiological change that enables them to survive in freshwater[3]. Once that physiological transition is complete, the salinity tolerance of salmon decreases. Exposing homing salmon to high levels of salinity has been associated with high mortality rates[4]. Increasing the salinity objectives in the southern Delta could degrade water quality, especially during the fall months, and could potentially impact fall run Chinook salmon returning to spawn.

- **EXPOSURE TO HIGHER CONCENTRATIONS OF POLLUTANTS SUCH AS PESTICIDES COULD DISRUPT SMOLTING AND HOMING CAPABILITIES, LEADING TO INCREASED STRAYING AND LOWER REPRODUCTIVE SUCCESS**

  Stagnation and poor water circulation in the southern Delta result in zones of accumulated salinity and pollutants. Weakening water quality objectives, coupled with the lack of numeric flow objectives year-round could increase the concentrations of salinity and pesticides in the southern Delta. Exposure to pesticides, such as Diazonin and atrazine, has been shown to disrupt migration of salmon[5][6]. As the board has

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[2] Martin, F. et. al 2009. Behavioral transition during the estuarine migration of wild Atlantic (Salmo salar) salmon smolt. *Ecology of Freshwater Fish* 18: 406–417.

[3] McCormick et. al 1998. Movement, migration and smolting of Atlantic salmon (Salmo salar). *Canadian. Journal of Fisheries and Aquatic. Science* 55: 77–92.

[4] Cooperman et. al. 2010. Effects of experimental manipulations of salinity and maturation status on the physiological condition and mortality of homing adult sockeye salmon held in a laboratory. *Physiological and Biochemical Zoology* 83(3): 459-472.

[5] Scholz, N. et. al 2000. Diazinon disrupts antipredator and homing behaviors in chinook salmon (*Oncorhynchus tshawytscha*). *Canadian. Journal of Fisheries and Aquatic. Science.* 57: 1911–1918.

[6] Moore, A. et. al. 2007. The impact of a pesticide on migratory activity and olfactory function in Atlantic salmon (Salmo salar) smolts. *Aquaculture* 273: 350–359.

heard in testimony, there is a very high straying rate along the San Joaquin tributaries and any increases in pesticide concentration along migration routes of salmon could lead to increased straying, decreased reproductive success and higher mortality[7].

CCWD requests that the SED includes an analysis that addresses the potential impacts changes in the water quality objectives could have on sensitive and protected species. Please call me at (925) 688-8100 or Maureen Martin at (925) 688-8323 if you have any questions or concerns.

Sincerely,

Greg Gartrell
Assistant General Manager

GG/MM:crp

[7] Tierny et. al 2008. Salmon olfaction is impaired by environmentally realistic pesticide mixture. *Environmental Science and. Technology 4:* 4996–5001