State Water Resources Control Board - Revised February 23, 2010

Informational Proceeding to Develop Flow Criteria for the Delta Ecosystem - Questions

Party submitting questions:		
Priority[1]	Question	Witness
1	Which flow-centric approaches have failed and what is the evidence they failed because of the flow standards and not other stressors to the Delta ecosystem? The data clearly establish that combined Delta exports continued to increase, not decrease, since the listing of Delta smelt and winter run Chinook almost 20 years ago until the recent cutbacks in exports due primarily to drought and to a much lesser extent court ESA rulings. [See attached chart.] Using the VAMP studies as an example, is it not possible that the supposed failure of flow-centric approaches occurred because insufficient seasonal Delta outflow was provided rather than just shifting the timing of overall increasing exports?	Export Contractors
2	The Contractors dismiss the large body of empirical data demonstrating statistically significant relationships between abundance and X2 for many pelagic delta species is due to a disregard of plausible mechanisms (e.g., X2 position affects availability of shallow water habitat area). However, in the section on salmon, a purely empirical result, the absence of a formally significant statistical relationship between OMR flows and salmon salvage (for flows no more negative than -6,100cfs) is used to deny that reverse flows have any harmful effect on salmon survival, despite an abundance of common-sense mechanisms which would lead one to expect that net flows into the export facilities results in increased exposure time to predation and poor food availability. How do you explain this inconsistent approach in your analysis?	Export Contractors

3	Given that 110 million fish were collected at the SWP screens over a 15-year period (Brown et al. 1996), can the Contractors explain how it is possible for entrainment not to affect delta smelt abundance?	Export Contractors
4	Given that the Contractors have recognized that at some level there will be a statistically significant impact to normalized salvage with negative OMR flow, is there a positive or negative relationship between negative flow in OMR and fish abundance?	Export Contractors
5	How can the Contractors defend that there should be no flow regulations for reverse flow in OMR, despite showing that at some threshold, negative OMR flow will cause a statistically significant impact to delta smelt from entrainment alone?	Export Contractors
6	As shown in the State and Federal Water Contractor's flow chart (Figure 6, Summary document), Delta Inflow is directly linked to the majority of "first-tier" controls on delta smelt abundance, including: starvation, contaminant effect, predation, and SWP-CVP entrainment. Given these relationships for the threatened delta smelt, why doesn't the "best available science" does allow the Board to establish threshold flow levels for this species?	Export Contractors
7	In the presentation of relative delta smelt abundance in Cache Slough vs Delta outflow (Figure 1), doesn't the increase in density at low outflow suggest that the population is constrained to an overall smaller amount of habitat at low flows? Isn't this consistent with long-recognized observations that X2 is a strong predictor of fish presence at a given location? Further, does it not follow that locating X2 over as broad an area as possible (e.g. Suisun bay and west) would result in overall decreased density but overall increased population size?	Export Contractors
8	Whether tidal water movements towards and away from San Francisco Bay continue today as under historical conditions is not salient to the maintenance of the populations of migratory and pelagic fish species. Do the reverse flows towards the SWP-CVP pumping plants provide access to traditional feeding grounds or migratory pathways?	Export Contractors

9	Other than the diatom inhibition reported by Dugdale et al (2006), please identify the peer-reviewed scientific studies that demonstrate positive correlations between fish or prey survival and variations in the selected pollutants at the concentrations found in the Delta.	Export Contractors
10	Since many "pollutants" arise of both natural and anthropogenic sources (e.g., BOD, ammonification of plant detritus, metal toxicity due to low Redox potential, etc.) is it not credible that the reduction of Delta inflow and outflow through water export would reduce the ecosystem's natural ability to assimilate and transform contaminants?	Export Contractors
11	Can a regulatory action provide a net benefit to a species and the public trust if it all only addresses one problem (e.g., reducing export-related take) while not addressing other problems (e.g., predation)?	Export Contractors
12	Has Dr. Ray Hilborn reviewed the stock recruitment model that Dr. Deriso used, which is the basis of many of the water contractors conclusions? If so, does he support these conclusions?	Export Contractors
13	Why did Dr. Deriso used a Ricker stock recruitment model (often used for ocean fisheries management) as opposed to the more commonly applied (asymptotic) Beverton-Holt model?	Export Contractors
14	In Table 1, isn't it the case that the entrainment fraction of some of the individual CWT release groups from the San Joaquin Basin is much higher than the average value reported for the coded-wire-tagged salmon released over the five-year period 1993–1998. Given the larger period of record available, why was this time period selected to illustrate this point?	Export Contractors
15	Please identify the peer-reviewed scientific studies and data supporting the claim that greater Delta outflow "will not likely help splittail and could even harm them by creating more empty space in upstream reservoirs leading to more capture of the needed flood flows".	Export Contractors

16	Please identify the peer-reviewed scientific studies and data supporting the claim that "the abundance of adult striped bass" is more closely tied to ocean conditions than to X2 changes?	Export Contractors
17	The Contractors' claim that that "even if aligning X2 with habitat locations were valid, another approach would be to create additional habitat farther upstream in order to maintain high volumes of habitat even at higher values of X2." [Contractors' Summary at 4.] Please identify the peer-reviewed scientific studies and data supporting the theory that high volumes of habitat lessen the importance of X2.	Export Contractors
18	The Contractors claim that "ammonium is more likely to be a true causal factor while the outflow correlation simply reflects dilution of a constantly growing load of pollution." [Contractors' Summary at 6.] Please identify the peer-reviewed scientific studies and data that support this contention.	Export Contractors
19	The Contractors claim that Spring X2 "no longer acts as a good predictor of fish abundance and continues to suffer from a lack of understanding of the mechanisms that create whatever correlations remain". [Contractors' Summary at 14.] Please identify the peer-reviewed scientific studies and data that support this contention.	Export Contractors
20	The Contractors claim that "until Old and Middle River flows exceed at least -6,100 cfs, they do not cause a higher proportion of adult smelt to be entrained at the export pumps." [Contractors' Summary at 14.] Please identify the peer-reviewed studies – which does not include the unpublished paper by Dr. Doriso – that support this claim.	Export Contractors
1	If Delta outflow is only a secondary driver of ecosystem functioning, is it the agency's position there would be no change in fish and other populations using the Delta if all through-Delta flow conveyance to the CVP and SWP were to cease?	Department of Water Resources

2	Since many of the water conveyance facilities and forebays of the CVP and SWP did not exist historically, doesn't the displacement of delta smelt from historical habitat into these facilities represent an interference with a primary mechanism such as access to shallow water habitat with a particular salinity range?	Department of Water Resources
3	X2 is used as a habitat indicator because it is easily measured, ecologically significant and integrates a variety of important properties and processes. In essence, the farther west X2 is located the greater amount of high quality shallow tidal habitat becomes available for a variety of pelagic organisms. Conversely, shallow tidal water habitats become much more restricted and less productive the farther east X2 is located. This dynamic is well documented in the scientific literature. Is it DWR's position in its submission to the SWRCB that the established science, much of which was developed by state agencies (including DWR scientists) and/or state funded programs, relating to X2 and its use as a habitat indicator is invalid?	Department of Water Resources
4	The Bay-Delta is among the most studied ecosystems in the world and yet SWR claims that relationships between flow and fisheries continue to be poorly understood. Is it DWR's position that the best available science today supports the trend toward increasing diversions out of the Estuary? What is DWR's recommendation to the Board as to when it should make decisions and isn't there risk that in waiting for the science to become more certain that the species that are – indisputably in decline – will become extinct if they continue along their current trajectory?	Department of Water Resources
1	Based on your understanding of the best available science, if Delta flows return to pre-Biological Opinion levels (2005-2006), is it likely that anadromous fishes will stay the same, improve in population abundance or continue to decline?	Dr. Rod Fujita (EDF) or Dr. Tina Swanson (TBI) or Dr. Jon Rosenfield (TBI)
2	Do you agree with the Contractors' contention that "flow-centric" approaches have failed over the last 20 years and will continue to do so? Why or why not?	Dr. Rod Fujita (EDF) or Dr. Tina Swanson (TBI) or Dr. Jon Rosenfield (TBI)

3	Some of the submissions have focused on the lack of certainty regarding flow and ecosystem interactions. Why shouldn't this lack of certainty preclude the Board from making public trust flow determinations? Do you agree with those in this proceeding who maintain that we simply do not know enough to reasonably set public trust flow standards?	Dr. Rod Fujita (EDF) or Dr. Tina Swanson (TBI) or Dr. Jon Rosenfield (TBI)
4	Some of the submissions maintain that invasive species and toxics are the primary causes of fisheries decline in the Delta and, therefore, it is not necessary or advisable to establish flow criteria for public trust resources. Is the science clear that these "other stressors" are solely responsible for fisheries declines? Is there a clear scientific basis to support the notion that the Delta estuary and its fisheries can reach a state of ecological health by dealing only with these other stressors and not flows?	Dr. Rod Fujita (EDF) or Dr. Tina Swanson (TBI) or Dr. Jon Rosenfield (TBI)
5	Do you agree with the Contractors that "ocean conditions" is the sole or primary causal mechanism responsible for fisheries declines and that exports and flow play little or no role? Why or why not?	Dr. Rod Fujita (EDF) or Dr. Tina Swanson (TBI) or Dr. Jon Rosenfield (TBI)
6	Some of the submissions maintain that the 2 years of implementation of the Biological Opinions establish that flow-related restrictions "don't work" and therefore should be abandoned. Is it possible that: (1) two years is an insufficient amount of time to allow these restrictions to work; or (2) that the restrictions were not restrictive enough?	Dr. Rod Fujita (EDF) or Dr. Tina Swanson (TBI) or Dr. Jon Rosenfield (TBI)
7	The Contractors maintain that nitrogen and phosphorus inputs are "likely" to be more important to algal species composition than flow. The studies relied on to support this point (Dugdale, Lomas, Gilbert) consider algal species but they do not appear to make any claim about the relative effect of algal formation as compared to flow. Are the Contractors' inferences from these studies scientifically appropriate and supported?	Dr. Rod Fujita (EDF) or Dr. Tina Swanson (TBI) or Dr. Jon Rosenfield (TBI)

8	Overall the Contractors and others have submitted testimony that maintains that flows are not connected meaningfully to ecosystem health or fisheries recovery in the Delta. Based on your understanding of the best available science, if Delta flows return to pre-Biological Opinion levels (2005-2006), is it likely that pelagic fishes will stay the same, improve in population abundance or continue to decline?	Dr. Rod Fujita (EDF) or Dr. Tina Swanson (TBI) or Dr. Jon Rosenfield (TBI)

[1]Please identify the top 10 priority questions concerning each participant's testimony or exhibits, with 1 being the highest and 10 being the lowest p