SAN JOAQUIN RIVER GROUP AUTHORITY
PRIMARY PANELISTS AND SECONDS

Panel : Scientific Basis for Developing Alternative San Joaquin River Flow Objectives

- Panelist: Dr. Gary Lorden
- Supported by: Dr. Sunny Snider; Doug Demko; Dr. Chuck Hanson

Panel: Hydrologic Analysis of the San Joaquin River Basin

- Panelist: Dan Steiner
- Supported by: Avry Dotan; Dr. Susan Paulsen

Panel: Scientific Basis for Developing Alternative Southern delta Salinity Objectives

- Panelist: Dan Steiner
- Supported by: Dennis Westcot; Dr. Susan Paulsen

Panel: Potential Water Supply Impacts

- Panelist: Dan Steiner
- Supported by: Avry Dotan; Dr. Susan Paulsen

Proposed Panel Questions Form
(Due 12 Noon, Wednesday, December 22, 2010)

January 6 and 7, 2011 Public Workshop on Draft Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives

____The San Joaquin River Group Authority_____
(name of individual participant or group of participants) requests that the following prioritized questions be addressed in the above workshop:

PRIORITY	QUESTION DIRECTED TO:	PROPOSED QUESTIONS FOR PANEL ON THE SCIENTIFIC BASIS FOR DEVELOPING ALTERNATIVE SAN JOAQUIN RIVER FLOW OBJECTIVES
1		Please see attached list of questions
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SJRGA QUESTIONS FOR PANEL ON THE SCIENTIFIC BASIS FOR DEVELOPING ALTERNATIVE SAN JOAQUIN RIVER FLOW OBJECTIVES

1. The DTR finds that "the primary influence on adult salmon escapement is flow two and a half years earlier during the juvenile rearing and downstream emigration life phase of the currently escaping adult population." (DTR, p. 49). In light of the findings of Drs. Lorden and Bartroff that the Newmann Bayesian hierarchical model analysis (Newmann 2008) is flawed, and that the DFG model has a number of inherent weaknesses which make all results derived therefrom of little value and with a low predictive capability, is the SWRCB still certain that the data supports the conclusion quoted above? **[directed to SWRCB staff]**

2. The DFG submittal contains Figure 3 at page 8, which is used to support the proposition that there is a relationship between Vernalis flow and juvenile salmon production at Mossdale. When the data for year 1989 is included, the R^2 is 0.27. What were the criteria used to justify the exclusion of the 1989 data? Were the same criteria used regarding the appropriateness of the use of data from the next three largest years? If so, did each of these three years' data pass the established criteria? If not, why were they nonetheless included? **[directed to DFG]**

3. The DFG submittal contains Figure 2 at page 7, which is used to depict Tuolumne River smolt survival as a function of Tuolumne River flow. Can the survival index exceed 1? If so, then the logistic regression that DFG appears to have used would not be appropriate for modeling this relationship since it is restricted to *y* values between 0 and 1, and it may also artificially inflate the "upward" relationship since it cannot chase the 1994 data point. **[directed to DFG].**

4. The "upward trend" in each of Figures 1-4 seem to be caused by just one, two or three special data points. This suggests that the fits of these models is unstable and not robust. Moreover, the *y* values in each of these figures are actually estimates with large uncertainties, so plotting them gives an air of certainty that is not real. What criterion did DFG use to determine which data points should and should not be included in the analysis? Did each data point pass the analysis? Was any data point that did not pass the analysis nonetheless included? Which ones? Why? **[directed to DFG]**

5. Using the data provided by DFG, Drs. Lorden and Bartroff found that the 1999-2009 data actually has a slight ***negative*** correlation between the logarithms of escapement and flow. In light of this, is the SWRCB still confident that "the primary influence on adult salmon escapement is flow two and a half years earlier during the juvenile rearing and downstream emigration life phase of the currently escaping adult population?" (DTR, p. 49). If so, please explain. **[directed to SWRCB]**

6. From the current state of the statistical modeling and analysis, how well do we know how much improvement in escapement would result from a specified increase in flow? For example, can a reliable estimate be given for the percentage increase in adult escapement– on average for 2013-2017, say -- that would result if the flows in 2011-2015 were 50% larger than the flows five years earlier—i.e. 2006-2010, year by year? In addition to an estimate, what range of percentage increase in escapement could be predicted with, say, 90% confidence? **[directed to SWRCB]**

7. The potential floodplain habitat in the lower San Joaquin River and South Delta is highly degraded and not comparable to the lower Sacramento River. Where are the locations that supposedly contain floodplain within the lower San Joaquin River and South Delta? What type of floodplain and how much would be available at various flows? How frequently and for what duration is floodplain inundation anticipated to occur? What is the timing of inundation relative to various lifestages? What is the measurable amount of benefit to various lifestages from the amount, frequency, and duration of floodplain inundation? Will modifications to Delta islands (such as removal of levees and taking islands out of agricultural production or tidal wetlands that may be part of BDCP) be considered as a means of increasing floodplain habitat and improving conditions for fish? **[directed to SWRCB]**

8. Much of the DTR and commenter's suggestions pertain to benefits of flows in tributaries, which should be outside of scope of the process. However, given the discussion, what type of floodplain and how much would be available at various flows in each of the tributaries? How frequently and for what duration is floodplain inundation anticipated to occur in the tributaries? What is the timing of inundation in the tributaries relative to various lifestages? Given that these tributary floodplains are different from the Yolo bypass (i.e., significantly smaller; inundation timing is later and duration shorter; elevation is higher leading to potentially lower water temperatures), what is the measurable amount of benefit to various lifestages from the amount, frequency, and duration of floodplain inundation in the tributaries? **[directed to SWRCB]**

9. The DTR and various commenter's indicate that higher flows will improve 12 functions (DTR, p. 48, 60-65), but provide little to no supporting information. Can you explain in detail and with relevant references (i.e., using references regarding similar sized, highly altered, and similar functioning watersheds, not references from unrelated rivers) for each function identified how, in the highly altered lower San Joaquin River and South Delta, that increasing flows can provide such functions? What is the measureable range of improved functions? How many fish is that expected to benefit? **[directed to SWRCB]**

10. Why are you using non-peer reviewed models as basis for identifying the need for flow prescriptions and for establishing recommended flow criteria? **[directed to SWRCB]**

11. Results of simple regression analyses based on spring flows may be misinterpreted due to multicollinearity (i.e. in years of high spring flows, winter flows are also usually high and vice versa). Any positive relationship between winter flow and escapement could exaggerate the perceived relationship between spring flow and escapement, because the positive effects would be inseparable. Since simple regressions are not an adequate statistical tool for accurately assessing the relationship between flow and the abundance or survival of salmonids in the SJR basin, how are you planning to address this inconsistency? **[directed to SWRCB and DFG]**

12. Given the high likelihood that the Head of Old River physical barrier will not be in place, how do you expect flows to influence smolt survival and water quality down the San Joaquin River and through the Delta channels? **[directed to SWRCB]**

13. Several commenter's agree that predation must be considered and even the DTR (page 56) includes a statement from the VAMP Peer review that indicates "only meeting certain flow objectives at Vernalis is unlikely to achieve consistent rates of smolt survival …and high and likely highly variable impacts of predation, appear to affect survival rates more than the river flow, by itself." Therefore, why is predator suppression, in lieu of flow, not considered as a mechanism for increasing smolt survival? **[directed to SWRCB]**

14. Ocean conditions were not considered yet have been found in recent years to substantially affect the salmon population. Why was there no consideration for adaptively managing ocean harvest along with water supplies to coincide with years when ocean conditions are predicted to be good versus other years? **[directed to SWRCB]**

15. What is the justification for using Chinook salmon as surrogates for steelhead? And why are salmon and steelhead being used as surrogates for all 'fish and wildlife' species? **[directed to SWRCB]**

16. Given the high numbers of CWT fish observed returning to non-natal tributaries throughout the Central Valley, which indicates a high degree of hatchery straying under current fall pulses (which typically occur earlier than would have under unimpaired conditions), how are fall pulse flows going to minimize straying to the Sacramento River? **[directed to SWRCB]**

17. Who will oversee peer review of the DTR, including the selection of unbiased experts? **[directed to SWRCB]**

18. Are you going to address what will happen to water quality (e.g., temperatures, dissolved oxygen, nutrient loading, etc) as a result of San Joaquin River Restoration Program? If not, why not? **[directed to SWRCB]**

19. Would your comments on pages 7-9 about models in general apply as well to the DFG San Joaquin Salmon Model? Why or why not? Would your comments apply as well to the models developed in *Recommended Streamflow Schedules To Meet the AFRP Doubling Goal in the San Joaquin River Basin* by Mesick (2005)? Why or why not? **[directed to CSPA]**

20. Would your comments on page 8 about the sufficient accuracy of linear regression analyses also apply to the regression showing spring flow at Vernalis versus escapement 2 ½ years later? **[directed to CSPA]**

21. Is the goal of developing alternative San Joaquin River Delta inflow objectives to provide "better" habitat or produce more fish? How will "better" habitat be achieved, i.e., what metrics will be used to determine success? **[directed to SWRCB]**

22. If the focus of this water quality control planning effort is on the Bay-Delta, why is there is so little information on flows, hydrology, salmon requirements, the availability of food and predation *within* the Delta? **[directed to SWRCB]**

23. What is the scope of this document and the proceeding to follow? The DTR and many of the comments seem to focus on both the Delta and the San Joaquin River and tributaries upstream of the Delta, while attempting to segregate them by suggesting the problem is in the Delta while the solution is upstream. More guidance is needed. **[directed to SWRCB]**

24. DFG submitted several charts showing the extent of floodplain inundation on the tributaries at various flows. Did DFG make any attempt to assess the quality of the habitat? Have you considered the levees along the San Joaquin River that will limit the area of the floodplain? Was there any analysis regarding the impact to private property/property rights? **[directed to DFG]**

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San Joaquin River Group Authority
Salinity Panel Questions

Questions for South Delta Water Agency

1. Your comments state that salinity conditions at Old River at Tracy Road Bridge ("OLD") and Old River at Middle River ("UNI") do not benefit from increased flows at Vernalis and are adversely affected by local diversions and discharges. Would regulating local diversions and discharges improve salinity at these locations?

2. Your comments identify discharges from the City of Tracy, Mountain House, and Deuel IV as particularly problematic for salinity in the Southern Delta. Would greater regulation of these discharges improve salinity conditions in the Southern Delta?

3. Your comments state that crop sensitivity to salt is most pronounced in the germination and early seedling stage. Would it be correct to say that this period is from late March to the latter half of June?

4. Your comments state that South Delta farmers must constantly leach salt due to fluctuating water tables. Using higher leaching fractions results in lower overall irrigation efficiencies. Do you expect that these irrigation efficiencies can improve in the future or is the present efficiencies what should be considered the norm for the immediate future?

5. In dry and especially critically dry years, flows and quality are often lower. During these periods farmers throughout the valley must make serious decisions on the best use of the available water. During these periods, what is most important to the South Delta farmers; 1) better quality water but lower flows in the San Joaquin River, or 2) higher flows in the San Joaquin River but poorer quality water?

Questions for the SWRCB Staff

1. Did Water Right Decision 1641 identify various factors downstream of Vernalis as influencing Southern Delta salinity, including tidal action, diversions of water by the State Water Project, Central Valley Project, and local water users, agricultural return flows, and channel capacity? If so, then why then are these factors not included in the regression analysis in Section 4.2.1?

2. Is the salinity degradation rate between Vernalis and San Joaquin River at Brandt Bridge ("BDT") uncommon among western rivers that flow into a saline estuary or the ocean?

3. The regression analysis for OLD shows a degradation rate 2-3 times that of UNI and BDT. Why is the rate so much greater? Could it be due to local sources? Could the City of Tracy WWTP discharge and/or the Mountain House Community Services District WWTP discharge, both of which are near OLD and were noted by SWRCB Water Quality Order 2009-0003 as known causes of serious localized salinity problems, be responsible for the elevated degradation shown in the regression analysis? If so, should greater regulation of

such discharges be used to improve salinity conditions at this location?

4. Comments you have received on the DTR and the comments received on the original Hoffman Report often stated that the use of "steady-state" analysis created an overly conservative analysis and likely an over predication of the impact of salinity on crop production. Does SWRCB staff feel the analysis was overly conservative?

Questions for the Panel generally and SWRCB Staff

1. Under field conditions, do soil boron levels, irrigation management, drainage and weather conditions also influence yields? If "yes," how would boron levels influence yields? How would irrigation management affect crop yields? How would salt management affect crop yields? How would irrigation management and salt management be used in conjunction to maximize crop yields? What are the irrigation and salt management practices in the Southern Delta?

2. Should salinity water quality objectives based on the salt tolerance of certain crops, such as beans, alfalfa, and almonds, be based on the times of the year when such crops are irrigated? Should the objectives apply at times when the crops are not irrigated?

3. Is unauthorized diversion and use of water, even for purposes such as irrigated agriculture, a beneficial use of water?

4. How much authorized diversion and use of water for irrigated agriculture occurs in the "non-irrigation season"?

5. Are there any municipal intakes in the Southern Delta? If there are "none", and none are anticipated, why should there be any objectives set for M&I water uses?

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PRIORITY	QUESTION DIRECTED TO:	PROPOSED QUESTIONS FOR PANEL ON THE POTENTIAL WATER SUPPLY IMPACTS OF POTENTIAL ALTERNATIVE SAN JOAQUIN RIVER FLOW AND SOUTHERN DELTA SALINITY OBJECTIVES
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San Joaquin River Group Authority
Water Supply Panel Questions

Questions for SWRCB Staff

1. What improvements in water use efficiency would be required for a 50 percent reduction in return flows? What actions to make such improvements would be required? What would be the cost of these improvements?

2. How would the Water Supply Impact analysis change if non-flow-based methods of controlling in-Delta salinity were used?

3. The Draft Report states that, in some cases, the Water Supply Impact is greater than all diversions in a particular month. What does this mean? When does this occur? How much greater than all diversions is the Water Supply Impact? Where would additional water come from to meet the hypothetical flow objective for a particular month when the Water Supply Impact exceeds all diversions?

4. What is the Water Supply Impact for meeting the Vernalis Salinity Objective and/or hypothetical SJR Flow Objectives, as opposed to the OLD and/or hypothetical SJR Flow Objectives?

5. What tool/metric will be used to quantify impacts to fishery/biological resources?

6. What tool/metric will be used to quantify economic impacts of water supply/environmental resources?

7. What will be the scope/breadth of potential land use impacts, e.g., fallowing, secondary impacts?