

## United States Department of the Interior

### Comments Regarding the California State Water Resources Control Board's Notice of Public Workshops for the San Joaquin River Flow and Salinity Objectives for the San Francisco/Sacramento-San Joaquin Delta Estuary:

#### PROPOSED MODELING ALTERNATIVES

*May 15, 2009*

##### **I. Introduction**

The Second Revised Notice of Public Staff Workshop and Additional Opportunity to Comment on Proposed Modeling Alternatives (Second Revised Notice) issued by the State Water Resources Control Board (Board) states that written comments on proposed modeling alternatives should be submitted by 12:00 noon on May 15, 2009. The U.S. Department of the Interior (Interior) submits these comments pursuant to the Second Revised Notice on behalf of both the Fish and Wildlife Service (Service) and the Bureau of Reclamation (Reclamation). Specifically, these comments will address the questions set forth in Attachments C and D to the Second Revised Notice.

Interior commends the Board and Board staff for delving into the specifics early in the process for the difficult, but necessary, job of reassessing the San Joaquin River flow and salinity objectives for the San Joaquin and South Delta. Interior's initial comments regarding the generally proposed modeling alternatives fall into two basic categories: 1) achievability --water supply and drought protection issues; and 2) effectiveness --the need to address fishery issues in the tributaries, as well as at Vernalis, and to set appropriate salinity objectives for the southern Delta. Essentially, Interior advocates for new flow and salinity objectives that are achievable given the natural water supply of the San Joaquin basin, and that are effective, or have a meaningful impact on the beneficial uses the objectives protect. Restoration of Chinook salmon and steelhead populations in the San Joaquin tributaries (Stanislaus, Tuolumne and Merced) likely cannot be achieved with a Vernalis objective only. In addition, Interior advocates for new flow and salinity objectives wherein beneficial use tradeoffs and priorities are clearly set forth by the Board so that meaningful objectives with priority are achievable and effective in all water year types, considering multi-year drought cycles. Objectives should not compete with each other for scarce water supplies. Instead, the Board should consider prioritizing objectives in drought years.

Achievability and effectiveness of objectives must be considered during this phase of exploring new objectives. Under California's Porter-Cologne Water Quality Control Act, water quality conditions that can reasonably be achieved is a factor the Board is required to consider. Cal. Water Code § 13241(c). The Board cannot consider achievability of water quality objectives only or first at the implementation phase. An accurate water

budget for the San Joaquin is key to water quality objectives that can be reasonably achieved. A water budget based simply on forecasted unimpaired flow, with no provision for long-term drought protection for all beneficial uses (flow based and consumptive), is unwise on a system such as the San Joaquin. The San Joaquin basin is prone to long and sustained drought periods. Any flow objectives that require more water than actual unimpaired flow necessarily require the benefit of stored water. Salinity objectives, if implemented through dilution flows, must also be understood as an additional demand on either unimpaired flow or stored water. In addition, the Board should assess how much unimpaired flow and stored water is appropriated to consumptive uses. In setting new objectives, the Board should use its modeling efforts to understand the relationship between meeting objectives for all beneficial uses over multiple years and how they impact carryover storage needed for drought protection. Also, the Board should use its modeling efforts to understand how flow-based objectives impact consumptive uses and stored water reserves in the over-prescribed San Joaquin basin, on an annual basis, but also in periods of multi-year droughts.

Effectiveness of objectives is also an important modeling consideration. Fish flow objectives measured only at Vernalis have not proven meaningful to fish needs on the San Joaquin tributaries. Likewise, it remains to be determined whether salinity objectives in the south Delta are meaningful to crops grown in the south Delta. Additionally, if south Delta agricultural objectives are transformed into flow-based dilution objectives, it is unknown whether the water cost of such a transformation would be a reasonable use of water given the decline of fisheries, and the over-prescribed nature of, the San Joaquin basin.

New objectives should allow for tradeoffs between beneficial uses, and set priorities for the basin. Such objectives would provide a more flexible system to maximize the effectiveness of new objectives in water short years than has been achieved under the current water quality control plan for the Delta, or under D-1641.

## **II. Attachment C: Proposed Modeling Alternatives for Southern Delta Salinity Objectives and Associated Questions:**

Currently, the Board is considering the following modeling alternatives:

1. Monthly average electrical conductivity (EC) at Brandt Bridge, of 0.7 mmhos/cm from April through August, and 1.0 mmhos/cm from September through March – no Vernalis objective applies.
2. Monthly average EC at Vernalis only, of 0.7 mmhos/cm from March through September and 1.0 mmhos/cm from October through February.
3. Monthly average EC at Vernalis only, of 1.0 mmhos/cm in all months.
4. Annual flow weighted average EC at Vernalis only, of 1.0 mmhos/cm and maximum monthly average EC at Vernalis only, of 1.5 mmhos/cm.

### **A. Questions on Alternatives**

1. Is this a sufficiently broad range of alternatives?

We are assuming that all of the proposed alternatives are utilizing dilution flow as the implementation method. Alternative 1 would then seem geared toward determining the water cost of changing the Brandt Bridge measuring station to a dilution point. However, without the Hoffman analysis it is very difficult to address whether the proposed range of modeling alternatives is sufficiently broad.

It is also extremely difficult to assess if the modeling alternatives are sufficiently broad enough in scope without having a "base case" modeling alternative (not necessarily D-1641 objectives) to compare impacts on other consumptive and flow-based beneficial uses. Technically, modeling alternatives should be compared against an accepted "base case" to quantify incremental impacts and to inform potential tradeoffs between flow-based and consumptive beneficial uses.

Interior suggests adding an alternative that includes no salinity objectives at Vernalis, or below, during the non-irrigation season months. This would help assess the water costs of dilution flows during the non-irrigation season and provide an opportunity for exporting salt out of the basin. In addition, the Board should consider an alternative that shows no salinity objectives at Vernalis, or below at any time. This would help assess the water costs of dilution flows all year.

1.1 Do the alternatives appropriately consider seasonality, averaging period, and applicable location?

No, see response above.

1.2 Should other factors/issues be considered, such as water year type?

Yes, many other factors must be considered before embarking on modeling of potential alternatives. Interior suggests that Board staff produce a scoping document which details the Board's modeling efforts, describes goals, objectives and assumptions used in modeling, and sets forth a process for stakeholder input, so that stakeholders and Board members are informed as to how the analysis will be conducted, and how stakeholder input will be achieved. In addition, it should reveal how tradeoffs between beneficial uses will be assessed.

Water year type is a simple surrogate for water availability in the San Joaquin Basin. Use of the 60-20-20 index in modeling can help determine water costs of objectives in different year types, but does not capture drought protection levels for stored water. If flow-based objectives require more water than actual unimpaired flow at any given time, they necessarily draw from stored water. New Melones, for example, is not intended to be drawn upon to its "dead pool," annually, but instead is and should be managed to include long-term, multi-year purposes (e.g. drought protection). The Board should use the modeling process to help identify carryover storage levels in all of the major San

Joaquin basin reservoirs to meet the needs of all beneficial uses in the short and long term.

Modeling alternatives should also include consideration of the Central Valley Regional Water Quality Board's TMDL implementation program, which is based on the Vernalis salinity standard. While the Regional Board's TMDL requires the Vernalis salinity objective be met through a monthly load approach, Reclamation's water rights are conditioned by the State Water Board to meet the objective through provision of dilution flows on a running 30-day average. As a result of this there are currently two regulatory approaches in place for salinity at Vernalis.

The water rights condition results in Reclamation providing dilution flow to offset all of the excess loads in the lower San Joaquin River in real time. The Basin Plan, on the other hand, calls for Reclamation to reduce, dilute, or offset the salt load brought into the basin by the Delta-Mendota Canal. These two approaches do not yield the same results. Interior therefore suggests that the Board examine the system through a loading approach as well as a dilution flow approach. A loading approach could also examine the opportunities that other flow requirements provide for exporting salt loads from the basin and the potential for redirected impacts when salinity loads are sequestered in groundwater basins.

2. Is there any one question that should be asked and answered by the group?

Yes, what is the appropriate drought protection level for reservoirs in the San Joaquin basin? How many years of drought protection should be targeted for long term storage reserves? How does storage impact temperature requirements for fishery needs and other beneficial uses? Given that the environmental analysis supporting D-1641 added water to the system to make all objectives -- agricultural, municipal and industrial, and fish and wildlife objectives, appear achievable in the aggregate, should D-1641 provide the "base case" for comparison? Interior believes it would be more appropriate to establish a base case for comparison purposes that is formulated by conditions similar to those in D-1422 and instream permits.

B. Questions on Information Needs

1. As part of our solicitation for this process, have you supplied us with the information you think we need for establishing and evaluating alternatives for the southern Delta salinity objectives?

No. Interior would like to see a scoping document, as described above. It is likely that Interior can provide useful model runs, data or expertise to the process, but not enough is known about how the modeling will actually be done for Interior to assess how it can contribute to the process. We believe that the Board should undergo an iterative modeling process that includes input from all stakeholders in an open process.

1.1 Specifically, what information is available regarding the potential economic considerations of adopting these alternatives?

Interior is aware of economic models available to give estimates of economic changes at regional levels. These models are “indicators” of change, and cannot “pinpoint” economic changes to individual stakeholders.

2. If not, (a) what has not been supplied, (b) who should or will provide that information, and (c) when will it be provided?

Again, Interior does not know enough about the proposed modeling to assess how it can contribute to the process. Ultimately, the Board will need to analyze alternatives under CEQA. Information needs under CEQA should be a reasonable guide.

3. Are there any other/different modeling efforts that will be needed to establish and evaluate alternatives for the southern Delta salinity objectives other than those identified below? (Transient state modeling (Hoffman analyses); CALSIM2 and DSM; Economics

A water temperature model for the San Joaquin Basin will be necessary to help evaluate how changes to southern Delta salinity objectives may affect water control systems which in turn affect the control of coldwater resources which may affect fish habitat value. Also, a model that includes a drought protection limit on use of stored water.

4. Staff intends to meet with the southern Delta salinity workgroup and rely upon a modeling workgroup to get additional feedback. Do you have any comments or suggestions?

Yes. Any and all additional feedback from any group should be made in a manner that all stakeholders can comment. This is why Interior believes that a scoping document that reveals modeling evaluation techniques and assumptions, and that is made available to all is essential to the success of this process.

**III. Attachment D: Proposed Modeling Alternatives for San Joaquin River Flow Objectives and Associated Questions:**

Currently, the Board is considering the following modeling alternatives:

1. Monthly average set percentage of unimpaired flows at Vernalis – High
2. Monthly average set percentage of unimpaired flows at Vernalis – Medium
3. Monthly average set percentage of unimpaired flows at Vernalis – Low

A. Questions on Alternatives

1. Is use of a fixed percentage of unimpaired flows a reasonable approach?

No. While unimpaired flows are a representation of the natural hydrology of a single given year potentially available for meeting all beneficial uses in the San Joaquin Valley Basin, it is important to recognize that a fixed percentage of unimpaired flows may result in very low flows in drought years. In addition, while the Board appears to be looking to model the “monthly average” percent of unimpaired flows, it is unclear what is meant by the “monthly average.” Is it the average daily flow of actual forecasted inflow for the month? a monthly average based on past years? irrespective of past water year types? In order to answer the question whether a fixed percentage of unimpaired flows is a reasonable approach, it is crucial to understand how the unimpaired flows are calculated, and for what timeframes. In addition, Interior does not believe that modeling only unimpaired flows at Vernalis is a reasonable approach. The Board should model a percentage of unimpaired flows contributed by the San Joaquin tributaries.

Interior recommends modeling flow standards that are sufficient to restore salmonid (Chinook salmon and steelhead) populations to the San Joaquin and its tributaries, and to achieve the Board’s salmon and steelhead doubling goals. The Board should not be confined by a fixed percentage of unimpaired flow to achieve fishery goals but should also consider modeling flows that are augmented with stored water. In addition, Interior believes the Board should model an appropriate drought protection policy to achieve multi-year beneficial uses in the San Joaquin and south Delta, and set priorities for those beneficial uses in drought years.

Interior is concerned that the Board appears to be looking only at unimpaired flow at Vernalis. We have seen that managing the San Joaquin system for flows only at Vernalis (a bottom-up approach) has not been effective in improving fish populations on the San Joaquin tributaries. The Board should include modeling alternatives that utilize a percentage of unimpaired flows from the San Joaquin tributaries (Stanislaus, Tuolumne, and Merced rivers), utilizing a top-down approach, as well as at Vernalis. When the Board models the flow standards from the tributaries (top-down approach), Interior recommends the Board continue to utilize Vernalis as a flow standard to ensure that flows contributed by the tributaries provide benefit to the fishery through Vernalis.

2. Is this a sufficiently broad range of alternatives?

No. The Board should include modeling alternatives that include a percentage of unimpaired flows required from the San Joaquin tributaries (Stanislaus, Tuolumne and Merced). In addition, the Board should model scenarios that include major reservoirs in the basin which can be called upon to augment unimpaired flow in water short years, provided that the Board also model appropriate multi-year drought protection levels and set priorities for beneficial uses in the basin.

Three model runs based on “high” “medium” and “low” percentages of unimpaired flow may not be adequate. A more meaningful analysis would likely be achieved by iteratively modeling various percentages of unimpaired flow. The Board should consider modeling 10%, 20%, 30%, 40%, 50%, and 60% of unimpaired flow being utilized for instream flow purposes at Vernalis and contributed by the tributaries. In addition, the

Board should consider and model how and whether stored water will be called upon to augment the calculated unimpaired flow.

2.1 Do the alternatives adequately consider seasonality, averaging period, and applicable location?

No. Fish life-stage requirements for adequate flow and temperatures should be considered (especially for salmon and steelhead). Spring emigration pulses and fall attraction flows should also be incorporated into the modeling. Flow requirements solely at Vernalis have proven inadequate to protect fish needs in the San Joaquin tributaries. Modeling flow requirements on the tributaries is critical.

2.2. Should other factors/issues be considered, such as water year type?

Yes, the Board should model the percentage of unimpaired flows by year type (critical, dry, below normal, above normal, and wet). The Board should also model carryover storage levels in the larger reservoirs (New Melones, New Don Pedro, Lake McClure, and possibly Millerton) to provide flows for fishery restoration. The Board would also need to model appropriate multi-year drought protection levels for major storage facilities in the basin.

2.3. Should an additional fixed annual quantity of water that is adaptively managed be considered?

Yes. An annual adaptive management volume should be considered by the Board and modeled. Interior believes an adaptively managed volume of water could allow for needed flexibility to allow objectives to be both achievable (reasonable) and effective.

3. Is there any other one question that should be asked and answered by the group?

Yes, what is the appropriate drought protection level for reservoirs in the San Joaquin basin? How many years of drought protection should be targeted for long term storage reserves? How does storage impact temperature requirements for fishery needs and other beneficial uses? Given that the environmental analysis supporting D-1641 added water to the system to make all objectives -- agricultural, municipal and industrial, and fish and wildlife objectives, appear achievable in the aggregate, should D-1641 provide the "base case" for comparison? Interior believes it would be more appropriate to establish a base case for comparison purposes that is formulated by conditions similar to those in D-1422 and instream permits.

## **B. Questions on Information Needs**

- 1. As part of our solicitation for this process, have you supplied us with the information you think we need for establishing and evaluating alternatives for the San Joaquin River flow objectives?**

No. Interior would like to see a scoping document, as described above. We believe the Board should undergo an iterative modeling process that includes input from all stakeholders in an open process. While there is uncertainty regarding the Board's modeling process, in our view establishing and evaluating modeling alternatives for the San Joaquin River flow objectives should be accomplished with flows from the Stanislaus, Tuolumne, and Merced Rivers. Additional parameters to bracket the modeling should include consideration of: seasonal flows, temperatures, floodplain inundation, dissolved oxygen, and other flow alternatives should be considered in addition to High/Medium/Low. Interior will provide a list of references and materials that we believe the Board should consider when establishing and evaluating its proposed modeling alternatives.

The alternative flow schedules on each tributary (Stanislaus, Tuolumne, and Merced) should be run through the San Joaquin temperature model to compare the modeled temperatures to the best available published literature for the optimal, suboptimal, and lethal temperature for each life stage of Chinook and steelhead. The presence of the different life stages of Chinook and steelhead can be obtained from: video weir monitoring, carcass surveys, redd surveys, and rotary screw traps.

**1.1 Specifically, what information is available regarding the potential economic considerations of adopting these alternatives?**

Interior recommends that the Board consider the economic benefits of increasing flows in the river: increased production of salmonids will improve sport fishing and commercial fishing, and will enhance recreational opportunities, etc. The benefits of sport and commercial fishing are available from a number of different sources including: angler groups, NOAA, California Department of Fish and Game (CDFG), Pacific Fisheries Management Council (PFMC), Public Policy Institute of California (PPIC), and others.

**2. If not, (a) what has not been supplied, (b) who should or will provide that information, and (c) when will it be provided?**

**(a) what has not been supplied?**

- Fish friendly monthly flow schedules for the Stanislaus, Tuolumne, and Merced rivers and to meet San Joaquin River (SJR) flow objectives.
- Fish friendly temperature schedule
- Seasonal considerations- e.g. fall and springtime pulse flows
- Information on the need for functional geomorphic processes (sediment transport, meandering), and the relationship between the needs and the flow alternatives.
- Economic analysis including benefits from increased fish production: NOAA, CDFG, PFMC, PPIC?

**(b) who should or will provide that information, and**

- The fish agencies should provide flow and temperature recommendations with help from geomorphologists to meet the functional need of geomorphic processes



- Information for the economic analysis on the benefits of increased production of fish should be provided by agencies with harvest opportunities as part of their mission (e.g. NOAA, CDFG, PFMC).

**(c) when will it be provided?**

The agencies should work with the Board to find an appropriate timeline that meets the needs of the Board and is manageable by the agencies.

**3. Are there any other/different modeling efforts that will be needed to establish and evaluate alternatives for San Joaquin River flow objectives other than those identified below?**

- CDFG salmon population model
- CALSIM 2 and DSM for hydrology- DWR
- Economics – to be determined.
  - Flow modeling on the Stanislaus, Tuolumne, and Merced rivers to meet SJR flow objectives
  - SJR basin wide temperature modeling at Vernalis, Stanislaus River, Merced River, and the Tuolumne River.
  - SJR basin wide water quality modeling (including DO,) at Vernalis, Stanislaus River, Merced River, and the Tuolumne River.
  - Fish models?
  - IFIM- Stanislaus, Merced, Tuolumne?
  - Anadromous Fish Restoration Program analysis- use as guide for this effort?
  - Trinity River analysis- use as guide for this effort?
  - Economic analysis including benefits from increased fish production
  - Step wise analysis 1. Model alternative flow schedules-> 2. model temperatures with proposed flows -> 3. compare temperatures with fish needs (using best available data for flow, temperatures and timing of life stages in river) to evaluate affects on the fishery
  - The Board should use the modeling process to help identify carryover storage levels to meet the short term (flow and temperature) and long term (flow and temperature) needs of the fishery

**4. Staff intends to form workgroups for SJR flow and modeling to get additional feedback. Do you have any comments or suggestions?**

In the spirit of providing an open and transparent process, Interior recommends the Board involve all interested stakeholders in the modeling process, and that the process be thoroughly documented and posted for public review. Further, representatives from all interested stakeholders should be given an opportunity to participate in staff workgroups to add their expertise to the process.