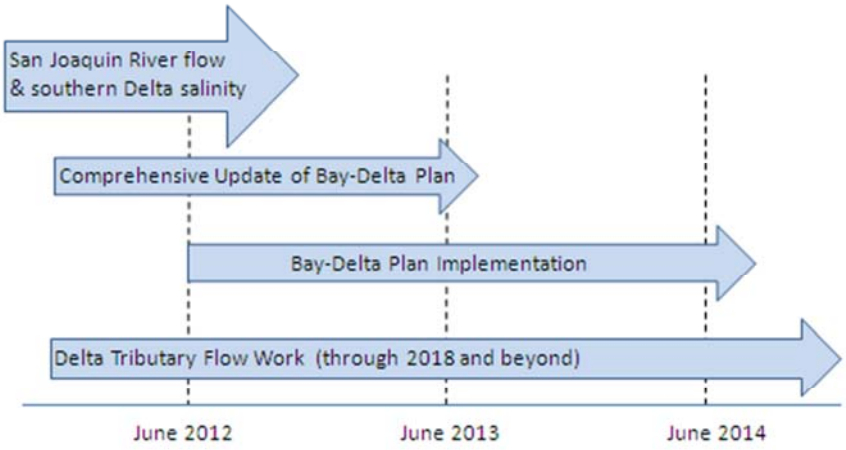
State Water Board Bay-Delta Water Quality Control Plan Update to Delta Independent Science Board

March 8, 2012

1) **Introduction and Update of State Water Board Efforts**
2) **Phase I: Southern Delta Salinity and San Joaquin River Flow Objectives**
3) **Phase II: Other water quality objectives including Delta outflow – Comprehensive Update**

1) Introduction and Update of State Water Board Efforts

State Water Board Processes



Upcoming Dates

- San Joaquin River flow and Southern Delta Salinity

February 24, 2012	Release technical and economic appendices
March/April 2012	Release draft environmental documents
June 2012	Workshop
August 2012	Release final draft environmental documents
October 2012	Board Meeting to consider adoption

- Comprehensive update of Bay-Delta Plan

January 25, 2012	Notice of Preparation
April 25, 2012	Written comments due
May 16, 2012	Scoping Meeting
February 2013	Release draft environmental documents
April 2013	Workshop
June 2013	Release final draft environmental documents
August 2013	Board Meeting to consider adoption

2) Phase I: Southern Delta Salinity and San Joaquin River Flow Objectives

Technical Appendices

- February 2012 "Scientific Report"

- Two additional technical appendices:
  1) Agricultural economic effects
  2) Hydropower and Electric Grid Analysis

- Recap of "Scientific Report" Conclusions:
  - Given the dynamic and variable environment to which SJR basin fish and wildlife adapted, and imperfect human understanding of these factors, developing precise flow objectives that will provide certainty with regard to protection of fish and wildlife beneficial uses is likely not possible. Nevertheless, the weight of the scientific evidence indicates that a higher and more variable flow regime in salmon-bearing SJR tributaries to the Delta during the spring period (February through June) is needed to protect fish and wildlife beneficial uses.
  - While using unimpaired flows may not indicate precise, or optimum, flow requirements for fish under current conditions, it would, however, provide the general seasonality, magnitude, and duration of flows important for native species (Fleenor et al., 2010 and Lund et al., 2010)
  - The State Water Board will incorporate appropriate measures for adaptive management in any new SJR flow objective in order to respond to new information and changing circumstances.

- Recap of major peer review comment
  - Generally well written and, taken as a whole, the comments are largely favorable. All five reviewers agreed that the current altered flow regime is impairing fish and wildlife beneficial uses and that more flow coupled with a more natural spatial and temporal pattern is needed in order to protect those beneficial uses.
  - The Technical Report focused solely on flow magnitude during the spring months, thus, not accounting for critical flow events occurring during different times of the year.
  - The rationale for examining 20-60% of unimpaired flow as the only scenarios limits a full investigation of the flows required to achieve fish and wildlife beneficial uses. It is unclear how a percentage of unimpaired flow of 40% would be an improvement over current medians, say of 44%. Why propose lower percentages?

- Initial Responses to peer review comments
  - Staff focused on flow influences on survival to the spring juvenile rearing and migration life stages, because, in the SJR basin, it is recognized that this is the most critical life stage for salmonid populations (DFG 2005a, Mesick and Marston 2007, Mesick et al. 2007, and Mesick 2009). Analyses indicate that the primary limiting factor for salmon survival and subsequent abundance is reduced flows during the late winter and spring when juveniles are completing the freshwater rearing phase of their life cycle and migrating from the SJR basin to the Delta (February through June; DFG 2005a; Mesick and Marston 2007; Mesick et al. 2007; Mesick 2009). As such, while SJR flows at other times are also important, the focus of the State. Water Board's current review is on flows within the salmon-bearing tributaries and the SJR at Vernalis (inflows to the Delta) during the critical salmon rearing and outmigration period of February through June.
  - Additional data and summary statistics have been added to the report. This data shows that flow objectives of even 20 percent of unimpaired flows would result in increased flows in many months. Currently median February through June flows in the Merced, Tuolumne, and Stanislaus Rivers are 26, 21, and 40 percent of unimpaired flow, respectively. In dry years, flows on the Merced and Tuolumne are sometimes less than ten percent of unimpaired flows, dropping once in June to a low of two percent.

- Stakeholder comments/questions directed to the ISB—are these the right questions?
    - Has a causal relationship between flow and escapement/survival been well established statistically?
    - Do the statistical analyses provide a reliable basis for setting flow policies to achieve quantitative goals?
    - How large are the margins of error in predictions based on the statistical models?

- Scientific Report Determinations:
    - Page 3-58:: "Given the dynamic and variable environment to which SJR basin fish and wildlife adapted, and imperfect human understanding of these factors, developing precise flow objectives that will provide certainty with regard to protection of fish and wildlife beneficial uses is likely not possible. Nevertheless, the weight of the scientific evidence indicates that increased and more variable flows are needed to protect fish and wildlife beneficial uses. While there is uncertainty regarding specific numeric criteria and how the SJR ecosystem will respond to an alternative flow regime, **scientific certainty is not the standard for agency decision making.**(emphasis added)"
    - Page 3-29: "Studies that examine the relationship between fall-run Chinook salmon population abundance and flow in the SJR basin generally indicate that: 1) additional flow is needed to significantly improve production (abundance) of fall-run Chinook salmon; and 2) the primary influence on adult abundance is flow 2.5 years earlier during the juvenile rearing and outmigration life phase (AFRP 2005; DFG 2005a; Mesick 2008; DFG 2010a; USDOI 2010). These studies also report that the primary limiting factor for tributary abundances are reduced spring flow, and that populations on the tributaries are highly correlated with tributary, Vernalis, and Delta flows (Kjelson et al. 1981; Kjelson and Brandes 1989; AFRP 1995; Baker and Mohardt 2001; Brandes and McLain 2001; Mesick 2001b; Mesick and Marston 2007; Mesick 2009; Mesick 2010 a-d)."

Management and Adaptive Management:

- Examples of management
    - Water Operations Management Team (WOMT)
    - Delta Operations for Salmon and Sturgeon Technical Team (DOSS)
    - CALFED Operations Coordination Group (CALFED Ops)
    - Sacramento River Temperature Task Group (SRTTG)
    - Stanislaus Operations Group (SOG)
    - Vernalis Adaptive Management Program (VAMP)

- Phase I San Joaquin River Program of Implementation Draft Adaptive management per April 1, 2011 Notice of Preparation; three levels of adaptive management:
    1. Annual and Short-term
    2. Long-term
    3. Periodically reviewed

Annual and Short-term Adaptive Management of Flows

- Coordinated Operations Group (COG), made up of fishery agencies, water users, etc.
- Establishes adaptive ranges
- Allow changes to instantaneous, monthly, daily, and running average flows on each tributary allowed so long as average flows over February to June period are no less than an established minimum unimpaired flow
- Flows do not have to rely on the unimpaired flow percentage method

- Initial procedures for an adaptive management process must be submitted to the Executive Director for approval
- Adaptive management plan may not be able to accurately forecast conditions that will occur during the February through June period, so plan should be designed to achieve the applicable unimpaired flow range

Long-term Adaptive Management of Flows

- Based on future monitoring and evaluation of flow information, allow modifications to the numeric requirements in this program of implementation so long as they will achieve the narrative San Joaquin River flow objective
- Modifications could include: changes to:
    - upper end of flows at which a percentage of unimpaired flows are no longer required
    - unimpaired flow range
    - base flows
    - instantaneous, monthly, daily, and running average flows on each tributary allowed so long as average flows over February to June period are no less than an established minimum unimpaired flow
    - lows that do not have to rely on the unimpaired flow percentage method

Periodic Review

- The State Water Board will still be required to periodically review the Bay-Delta Plan

Questions for Delta ISB:

1) Do you concur with the scientific report determination that changes in the flow regime of the San Joaquin River basin are impairing fish and wildlife beneficial uses?
2) Does the Scientific Report demonstrate:
    a. the relationship between flows and SJR basin fall-run Chinook salmon survival and abundance?
    b. the importance of unaltered hydrographic conditions in supporting ecosystem processes for Chinook salmon, Central Valley steelhead, and other native species?
3) Does the approach used to develop San Joaquin River flow objectives and the associated program of implementation provide for the reasonable protection of fish and wildlife beneficial uses?
4) Does use of a percent of unimpaired flow provide an appropriate method for implementing the narrative San Joaquin River flow objective in a way that reasonably protects fish and wildlife beneficial uses, given the other factors that the State Water Board must consider when determining a reasonable level of protection for beneficial uses?
5) Given scientific uncertainty, does the program of implementation allow for the development of a successful science-based adaptive management program?

3) Phase II: Other water quality objectives including Delta outflow – Comprehensive Update

Comprehensive Review Notice of Preparation

- Supplemental Notice of Preparation January 24, 2012
- Scoping Meeting May 16, 2012

Potential Comprehensive Review Topics

- Delta Outflow
- Delta Inflow
- Export/Inflow Ratio
- Delta Cross Channel Gates
- Reverse Flows in Old and Middle Rivers
- Suisun Marsh
- Floodplain Habitat

Development of Scientific Basis for Bay-Delta Plan Amendments - three potential "scientific reports"

1) Scientific Basis for Potential Modifications to Delta Outflow and Inflow Objectives (includes low salinity zone, "X2")
2) Scientific Basis for Potential Modifications to Objectives Affecting Delta Hydrodynamics (includes reverse flows on Old and Middle Rivers)
3) Scientific Basis for Potential Modifications to Suisun Marsh Objectives and Potential New Floodplain Habitat Objectives (includes Yolo Bypass floodplain inundation)

Potential Areas for ISB Involvement

- Consultation regarding other topics that should be studied
- Preferred approach for ISB review of scientific reports:
    - Early ISB input on proposed approaches that will be used to develop scientific reports, or
    - Review of draft scientific basis of reports prior to standard independent peer review
    - Timing

- ISB participation in workshops
    - Joint ISB / SWB workshop(s)?
    - Potential "early" SWB workshop topics:
        - Hydropower
        - Delta Outflow/Low Salinity Zone
        - Economic Effects
        - Adaptive Management to comply with Control Programs in Water Quality Control Plans
        - Hydrologic Analysis
        - Environmental Document Project Alternatives Screening Analysis
        - Environmental Document Impacts of project alternatives to climate change
        - Environmental Document Impacts of project alternatives to groundwater resources