

CALFED Science Program Workshop Summary

Science Issues Relating to Delta Conveyance Infrastructure: An Isolated Facility

August 22, 2007

This workshop focused on an isolated facility as the conveyance mechanism for moving Sacramento River water to the export pumps. A second workshop scheduled for September 11, 2007 will examine issues associated with various through-Delta conveyance options. Considered together these workshops will help identify the issues and questions that need to be raised in evaluating an effective Delta-region conveyance mechanism for water project exports.

Topics and Speakers:

History of the Isolated Facility - Mr. Dan Odenweller, Regional Water Quality Control Board
Design and Operational Issues - Mr. Dennis Majors, Metropolitan Water District of Southern CA
Environmental Issues - Dr. William Bennett, University of California at Davis
Water Quality Issues - Dr. Samuel Luoma, United States Geological Survey
Economic Issues - Dr. Richard Howitt, University of California at Davis
Synthesis - Dr. Wim Kimmerer, San Francisco State University
Bay-Delta Conservation Planning – Mr. Jerry Johns, Department of Water Resources
Discussion - Dr. Michael Healey, CALFED Science Program

This summary report and the speakers' presentations have been posted on the CALFED Science Program website (<http://science.calwater.ca.gov>).

Overall Key Messages:

The seven specialists agreed that the current through-Delta system is not working. However, they also found that every conveyance option has benefits, risks, and uncertainties – an Isolated Facility offers no “silver bullet” or “non-impact” way for solving all Delta-based ecological and water supply problems. For example, while an Isolated Facility can reduce entrainment of smelt in the South Delta, if there is an intake on the lower Sacramento River, there remains the possibility that Delta smelt can be entrained there, especially in low-flow years. How the system will be operated is critical to estimating its effects. From an ecological perspective it is difficult to say whether a particular species will benefit from, or be harmed by, the construction and operation of an Isolated Facility.

The panelists also observed that there is a trade-off between obtaining higher quality Sacramento River export water using an Isolated Facility and increased discharge of lower quality San-Joaquin River water into the Delta. Moving intakes to the Sacramento River will do nothing to solve San Joaquin in-valley issues like selenium, salt accumulation, or pesticide runoff, and may increase the impact of pollution in the South Delta.

The panel agreed that we know a lot more now than we did in 1982 about the physical and biological dynamics of the Delta ecosystem and are in a better position to analyze the effects of various management tools like an Isolated Facility. For example, the Bay-Delta (CALFED) science infrastructure is able to evaluate the effects of proposed alternatives for export and conveyance. However, it cannot provide “the answer” with regard to conveyance infrastructure construction options. The panel agreed this was ultimately a policy choice.

Traditional approaches to public funding for an Isolated Facility (e.g. bond financing) is inadequate for underwriting “up-front” construction costs. A system of soliciting up-front user financing could provide an alternative that would employ market mechanisms to establish important aspects of size and operation.

Hydrodynamic modeling is critical for full evaluation of analyzing alternate conveyance systems in the Delta. Existing modeling capacity in the Delta will benefit from improved coordination and revitalization. Bay-Delta water quality discussions need to consider more completely the effects of the Bay and coastal-ocean habitats since the Delta and the Bay are intimately interconnected.

Finally, if an Isolated Facility is to be pursued, a flexible, modular approach for designing and constructing it is important for maintaining an adaptive management capability over the period of transition from the current through-Delta system, and must continue for the lifetime of water conveyance management.

Key Messages Associated With Individual Presentations:

History and Motivations for an Isolated Facility – Dan Odenweller

- The isolated facility concept was first formally considered in 1943 as a way to protect sport and commercial fisheries from pumping impacts and improve export water quality and has been a subject of debate for decades
- The suite of species driving management concerns about pumping has changed over time, and has included shad, bass, salmon, and smelt species
- Original designs for the Isolated Facility (Peripheral Canal) included dedicated supplies applied for dilution of pollutants in the Delta and downstream flushing flows
- There is a continuing need for some sort of conveyance of water from the Sacramento River to the export facilities regardless of measures taken to protect or restore fisheries

Design and Operations Issues – Dennis Majors

- An open, unlined canal will have risks associated with seepage and regional flooding – in various configurations portions of the canal will be elevated and contained in levees or below sea level whether raised or incised, with or without fill embankment
- There will need to be siphons under all stream and slough crossings regardless of design elevation

- There will need to be substantial fish screening facilities, regardless of intake location
- The canal will flow by gravity but there will need to be a lift pump to raise the water to SWP and CVP facility elevation at some point in the system
- The cost of one or more pipelines of a size sufficient to carry the needed volume of water is such that an open canal is preferred

Environmental Issues – William Bennett

- An isolated facility can reduce entrainment of smelt in the south Delta, but if there is an intake on the lower Sacramento River there remains the possibility that you can entrain Delta smelt there, especially in low-flow years – how you operate the conveyance infrastructure is critical to estimating its effects
- The proposed intake location at Hood may increase entrainment of Delta smelt since this location is near spawning locations in and around Liberty Island, Cache Slough, and the Sacramento Deep Water Ship Channel
- Improved hydrodynamic understanding is crucial to assessing impacts of an isolated facility. Current hydrodynamic modeling tools are not universally accepted, and therefore current particle tracking models are uncertain.
- Each management action is an experiment, and management responses and social structures should reflect this fact
- Adaptive Management is necessary for the lifetime of water conveyance management, NOT merely as a precursor to project construction

Water Quality Issues – Sam Luoma

- Bay-Delta water quality discussions need to consider more completely the Bay and coastal ocean (both as independent drivers and recipients). The Delta and the Bay are intimately interconnected
- Every form of conveyance has benefits, impacts, and risks for water quality. The isolated facility will improve export water quality, however most designs will allow more poor quality San Joaquin water to flow into the Delta – there is a need to address in-valley water quality issues via in-valley solutions before implementing conveyance solutions
- Increasing urbanization will lead to more water withdrawal and higher pollutant loadings
- Any configuration of conveyance will need to confront the changes to in-Delta water quality that results from the new configuration and operation

Economic Issues – Richard Howitt

- Historic patterns of financing for major projects like an isolated facility don't include “up front” financing
- Consider pricing the isolated facility by selling water in relation to its reliability of delivery

- Sell water as a product of amount times reliability. Do not sell shares of the canal or an explicit right to a volume of water
- Urban water users are intolerant of variation in supply but tolerant of high price and so will pay a high price for a relatively small but reliable supply. Agriculture, on the other hand, is intolerant of price variation but more tolerant of supply variation and so will purchase high but relatively unreliable volume at low price.
- By auctioning water delivery in relation to its reliability, payment for the isolated facility can be accomplished “up front”. By this means the facility can be self-financing, self-sizing, and adaptable to user preference and desire to pay
- Decouple delivery and pricing structures from environmental water (agree up front what absolute supply will be dedicated to the environment)

Synthesis of Issues – Wim Kimmerer

- All science and technical issues related to an isolated facility have high uncertainty. The implications of the isolated facility for ecological processes are particularly uncertain. Proceed with caution
- Eliminating the take of Delta smelt (or other species) at the existing export facilities will not necessarily restore the species and will not restore the Delta ecoregion
- Ecosystem “regime shifts” have become the norm in the Bay-Delta, and should be expected to continue into the future (e.g. invasive species that have affected various parts of the food web). These shifts are not limited to food webs or community identities but include eco-regional productivity modes as well (e.g. pelagic versus benthic)
- Our current project planning procedure is linear and assumes that the Delta of the future will be the same as the Delta of today – it does not effectively incorporate new information or flexible strategies. A more integrative, iterative and experimental approach needs to be implemented to deal effectively with inevitable surprises and future change

Bay-Delta Conservation Planning – Jerry Johns

- Use of an isolated facility can mean that the Delta does not need to be managed as a fresh-water supply source for exports
- An isolated facility potentially removes the conveyance issue from the ecosystem allowing greater flexibility for ecosystem management

Public Discussion

- Statewide water management has tended to use a piecemeal or “atomistic” approach – public policy would be better served with a “big picture” approach integrating high environmental variability with specific water project operational criteria
- There are precedents for legally requiring water delivery systems to operate at less than full capacity (e.g. Mono Lake)

- A flexible, incremental approach to building water supply and management infrastructure is warranted

Final Comments – Michael Healey

- Discussion was less than expected regarding: a) drinking water quality, b) the six “drivers of change,” c) alternative locations for intakes, d) competing intake/fish facility designs, and e) whether an isolated facility would be in-ground or above-ground
- The consensus is that the current through-Delta system is not working