

**DRAFT - 3/16/2000
Summary of the Proposed Central Delta Intakes Analysis**

Background and Level of Effort

Technical representatives from the CALFED Bay-Delta Program staff and member agencies were asked in late February 2000 to investigate a staged proposal related to diverting water in the Central Delta for South Delta improvements, In-Delta storage, and eventual CVP/SWP connection. The original proposal was described and presented at a joint meeting of the Water Management Coordination Team and the Central Valley Fish Facilities Review Team on February 24, 2000. A description of the options, components, and assumptions are presented below. From this initial meeting, a number of assignments were made to various groups and individuals to investigate the technical feasibility, merits, and impacts of this proposal. The proposal analysis was limited since a presentation to the CALFED Management Group needed to be completed by March 14, 2000. It should be noted that although a considerable level of discussion and review of this alternative occurred in the limited time period, participation by some experts and detailed investigations (including DSM2 hydrodynamic and water quality modeling) were not completed.

Products/Summaries/Meeting Notes

A number of meetings were held to discuss this alternative. Notes or summaries were produced for several meetings (WMCT/CVFFRT, DEFT, and a core group meeting) and are available upon request. In addition, meetings were held to review the CALFED Bay-Delta Program's Programmatic EIS/EIR documentation and the South Delta Improvements Program's EIR. The presentation to the Federal-State Water Management Group on March 14, 2000 reflected the preliminary results of the analysis and described the changes being made to the CALFED Bay-Delta Program Environmental Documentation as a result of the effort. A summary of the analysis is provided below. The two PowerPoint presentations and the DEFT summary were distributed at the March 14, 2000 meeting (also available upon request).

Description of the Proposed Central Delta Intake Options and Components

The following figure shows the options and components of this alternative as originally presented. The following is a brief description of the various options and their functions.

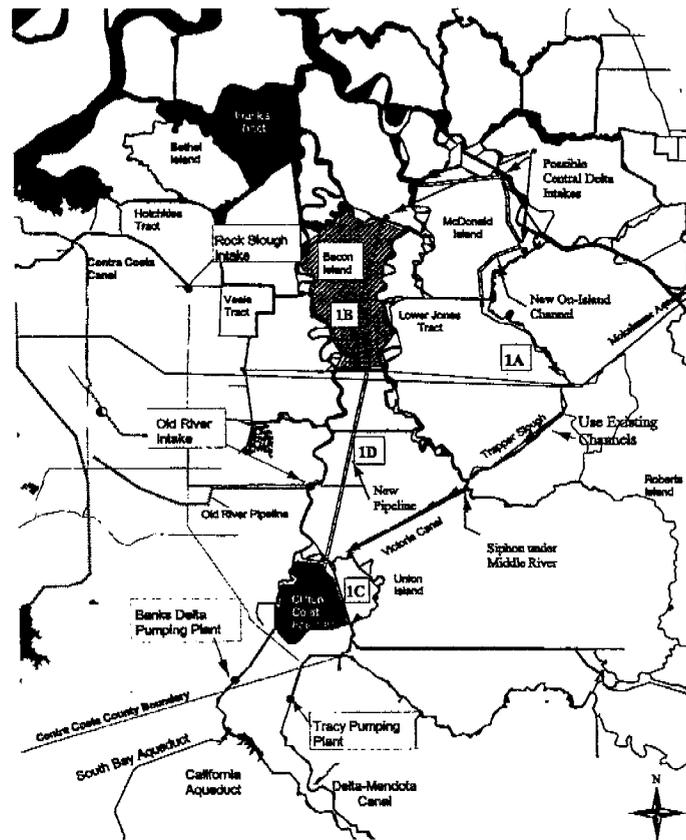


Figure 1 - Central Delta Intakes Options and Components (as Presented)

McDonald Island Option: Multiple intakes (with a total diversion capacity of 4000 cfs) around the periphery of McDonald Island could be used to deliver water to southern delta agriculture, and in future phases deliver water to the State/Federal export facilities. The maximum diversion rate for the first stage actions (i.e. South Delta irrigation use) is approximately 1500 cfs at the height of the summer growing season. As presented, water could be conveyed south from

McDonald Island via a combination of existing channels (Trapper and Whiskey sloughs, Victoria Canal would be isolated), siphons, and overland conveyance. Delivery to delta agriculture would require an on-island overland distribution network. The present South Delta Improvements work plan includes consideration of a consolidated point of diversion that would deliver water to delta agriculture from Clifton Court Forebay.

Bacon Island Option: Several intakes (total capacity 4000 cfs) around the periphery of Bacon Island could be used either to fill storage space on the island (120 TAF) or as a site of direct diversion for the State and Federal export facilities. This option includes a direct connection to Clifton Court Forebay.

The McDonald and Bacon Island options were presented as possible tools CALFED might more fully evaluate in Stage I. Because each option would have several components and serve several functions, there are a variety of ways of phasing in these options, particularly in regard to their interactions with other parts of the CALFED program. The options would need to be integrated with the South Delta Improvements Program, the Integrated Storage Investigations, the proposed Hood Diversion, several components of the Ecosystem Restoration Plan, and other parts of the CALFED Bay-Delta Program. None of these options were presented as final designs or as exclusive alternatives to other elements of the CALFED Bay-Delta Program.

Assumptions made in the Analysis

For purposes of this evaluation, the analysis was based on the elements and options presented. In actuality, the final determination of both Delta storage and conveyance elements may be different. In all cases, Central Delta diversions were assumed to occur through screens that did not require associated fish salvage and handling operations although a final determination of this has not been made. It was also assumed the screening of delta agricultural diversions called for in the Ecosystem Restoration Plan would be in place. Therefore, the evaluation of this proposal focused not on the benefits of screens but on the effects of a consolidated diversion point for delta agriculture, listed fish species and water supply compared to the large number of existing diversions.

It was assumed that these facilities would be operated to reduce overall export impacts. In fact, such operations might require considerable more knowledge of fish distribution and vulnerability to diversion impacts than is currently available.

Components taken from Previously evaluated Alternatives

This proposal differs from those considered in the past because significantly less water is assumed drawn from the Central Delta. CALFED has reviewed a number of alternatives that appeared to have similar Central Delta intake features, such as alternatives 2C and 3I, but those had many other features that

made them either more expensive or had more environmental impacts due to their size. As proposed, the Central Delta Intake alternative included a component that would eliminate the need for barriers by serving their demands from an isolated diversion channel and extensive on-island distribution system. South Delta CVP/SWP diversion facilities and the proposed CVP/SWP intertie are still included.

It is important to note that the present preferred CALFED alternative includes a programmatic description of including Island Storage and South Delta improvements.

Programmatic Perspective of the Proposal

Components of this proposal merit further investigation; however, the recommended actions do not conflict with the preferred alternative in the CALFED programmatic EIS/EIR (with a few clarifications currently being incorporated). It is important to note that the CALFED Bay-Delta Program is only looking at this proposal from a programmatic point of view. Detailed descriptions of the components that will be used in the preferred alternative will be analyzed in Project Specific EIS/EIR's as to what islands will be used for storage and how much; the allowable maximum diversion rate from the Central Delta; the components of the preferred South Delta Improvements program alternative; the operational requirements of this alternative; and the interrelationships of these components to other program elements; etc. CALFED has beefed up their documentation to include a better discussion of the CVP/SWP connection to Delta storage and the scope of the South Delta improvements currently being considered.

Merits of the Proposal

The CALFED Bay-Delta Program should consider the island storage and connection to the SWP and CVP Export facilities because:

- The "gaming" effort has shown the potential advantage of these facilities;
- South Delta water levels will indirectly improve as a result of the shift in point of diversion;
- The flexibility of two diversions points (South Delta and Central Delta) may be better for fish, water quality, and operations than only one intake in the South Delta;
- Delta storage could be used for the EWA, water quality releases, temporal diversion shifts; and
- Shifting a portion of the CVP/SWP intake to the Central Delta may improve reliability

Problems with this Proposal

The McDonald Island Intake will be very difficult to implement as presently outlined in the proposal. Some elements of this portion of the proposal however are being looked into. The South Delta Improvements Program has expanded the scope and analysis of various project components to include combinations of various barrier configurations, dredging alternatives, consolidation of agricultural diversions, and on-island water distribution systems that may serve a portion of South Delta needs (for example, the on-island distribution system being considered in the SDIP could pump water from Clifton Court Forebay and serve a portion of the areas most affected by not placing a Grantline barrier).

The SDIP has not considered a no-barrier alternative that distributes water to all South Delta lands via an extensive on-island distribution system as presented in the Central Delta Intake alternative (the McDonald Island Intake side of the alternative). An extensive on-island distribution system that would divert from an isolated diversion channel (i.e. screened), would have to serve approximately 100,000 acres distributed over several Delta islands. A number of issues make implementation of this component difficult as a Stage 1A action including:

- extensive timeline to stage and construct this system;
- water rights issues;
- high costs (up to \$500 million); and,
- cooperation of landowners to implement this system

Therefore, since there are functionally a number of alternatives that will improve South Delta water quality and diversion issues, this component of the proposed alternative does not solve the problems in the South Delta.

No Need to have Two CVP/SWP Connections from the Central Delta

A proposed future phase of the McDonald Island diversion included a connection to the SWP/CVP export facilities. It was determined that having only one connection to the Central Delta would be functionally equivalent to two since both intakes would be from the Central Delta. Therefore, a connection from a storage island would serve this purpose better. Consolidating two intake channels into one further questions the need to serve the South Delta needs from the Central Delta diversion.

Fisheries Impacts

The Diversion Effects on Fisheries Team looked at a number of fisheries impacts associated with this proposal. Impacts on salmon, steelhead, delta smelt, splittail and striped bass were investigated. A number of beneficial and detrimental hypotheses were looked at for various species. Potential benefits include:

- Reduces Impacts on Estuarine Species due to spatial and diversion time shifts;
- Reduces Fish Handling and Salvage Operations (assuming the diversion screens are sized and distributed appropriately and don't require salvage facilities);
- Improved local hydrodynamics at fish screens in the Central Delta due to tidal dispersion and large channel effects (if sized appropriately)
- Minimizes Barrier Impacts - They could be operated less due to improved water levels

Potential fisheries impacts of a Central Delta diversion include:

- More impacts on salmon and steelhead due to proximity and exposure to migration corridors;
- Central Delta Intakes may increase exposure and entrain smaller life stages not protected by screen (vulnerability issue);
- This alternative may not fundamentally solve the fisheries issues since the overall hydrodynamic influence in the Delta from CVP/SWP operations (no change in Q-West or Cross Delta Flow) doesn't change much by simply shifting diversions into the Central Delta; and
- Quality of information used for operational flexibility decisions may be questionable - we lose salvage information. CMARP/IEP need to address this issue

Fish Screen Issues

The assumed benefit of diverting flows from the Central Delta (versus the South Delta) comes from both the operational flexibility (i.e. diverting flows when fish are less abundant in the Central Delta) and the reduced fish handling due to an "on-river" screen concept (i.e. no "fish salvage" facilities and operations). On-river screens are preferable if hydraulic conditions warrant their use. If too much water is diverted in the Central Delta relative to the flow in the adjacent channels and the tidal dispersion is inadequate to sweep fish away from the screen's draw, a sump condition may result. In this case, fish would need to be collected and transported away from the intakes influence much like the existing South Delta CVP and SWP fish protection facilities.

Distributing the intake screens around the periphery of an island would limit fish exposure to the individual screen units. However, the accumulated impact of many individual screen units would have to be considered. The proposed Delta Wetlands project has considered this distributed diversion concept with a maximum diversion rate of 4000 cfs onto the island (if fishery and hydraulic conditions warrant).

Although preliminary, combined diversion rates over 4000 cfs in the Central Delta may require salvage facilities. It should be remembered that even before the

SWP South Delta export facilities came on-line, it was agreed that the CVP's 4600 cfs Tracy Pumping Plant needed to be protected with a fish salvage facility.

Water Quality Issues

A preliminary analysis of water quality impacts shows a number of potential benefits of a Central Delta diversion, storage, and CVP/SWP connection. It should be noted that a detailed modeling effort has not been completed, but the following benefits are generally accepted:

- Salinity is generally lower in the vicinity of the Central Delta intakes compared to the South Delta;
- Access to Central Delta water may provide salinity benefits to in-Delta users if connected;
- Water quality improves as the intakes get closer to Georgiana Slough and the Mokelumne River;
- TOC spikes in the Delta could be avoided with storage and connection; and,
- The flexibility may create opportunities for water quality benefits (poor water quality in South Delta could be mixed with better quality water from the Central Delta)

Potential water quality impacts include the following:

- Shifting exports to the Central Delta causes a slight degradation to South Delta salinity;
- Salinity benefits obtained by access to Central Delta water may be negated through the CVP/SWP export blend; and,
- Changes to the organic carbon load due to Delta island storage have not been adequately examined (the tea bag effect).

Conclusions and Thoughts on Further Investigations

The added flexibility and merit of the island storage, SWP/CVP conveyance, and the Central Delta intakes elements merit further investigation. These components are incorporated into the preferred CALFED Bay-Delta Program Alternative. This has been accomplished by beefing up the CALFED environmental documentation to include a better description of Delta storage and possible conveyance options. It is important to consider a range of options because it is likely that if Delta storage were implemented, it would be staged and operated first as an independent storage facility with releases into Delta channels. Only after water quality and other issues are addressed would there be consideration of connection to SWP and CVP facilities. Or perhaps, Delta storage may also be linked to other program elements such as an expanded Los Vaqueros. Therefore, the PEIS/EIR will address a process that will be used to

investigate the discharge options and impacts from not only Delta storage, but all potential storage facilities.

In considering South Delta improvements options, the CALFED Programmatic EIS/EIR Documentation has also incorporated a number of improvements that address a number of additional options now being considered in that program.