

CR 5 Alternatives

This response is to comments regarding CALFED Program alternatives. Comments include: the Program has not looked at a broad range of alternatives, including that no alternatives to common programs were evaluated; Program alternatives will not meet water quality objectives; Program alternatives will not improve water supply reliability; and alternatives that only met some of the Program objectives were not considered. The headings of sections 5.1-5.4 of this response reflect themes of comments received.

5.1 Program has not looked at a broad range of alternatives

CALFED developed, in the initial phase of Program development, alternatives to meet the Program's purpose and need statement as well as the CALFED mission statement in a lengthy and consensus based process. The purpose and need statement is a critical element that serves as an important screening criteria for determining which alternatives are reasonable. The purpose of the Program is to develop and implement a long-term comprehensive plan that will restore ecological health and improve water management for beneficial uses of the Bay-Delta system. To practically achieve this purpose, CALFED concurrently and comprehensively addressed problems of the Bay-Delta system within each of four resource categories: ecosystem quality, water quality, water supply reliability, levee system integrity.

Important physical, ecological, and socioeconomic linkages exist between the problems and possible solutions in each of these categories. In the past, most efforts to improve water supply reliability or water quality, improve ecosystem health, or maintain and improve Delta levees were single-purpose projects. A single purpose can keep the scope of a project manageable but may ultimately make the project more difficult to implement. The difficulty occurs because a project with narrow scope may help to solve a single problem but have impacts on other resources, causing other problems. This in turn leads to conflict. Ultimately no problem is solved, or one problem is solved while others are created.

The Program took a different approach, recognizing that the problems in the Bay-Delta system are interrelated. Problems in any one problem area could not be solved effectively without addressing problems in all four areas at once. This greatly increased the scope of our efforts but has enabled us to make progress and move forward to a lasting solution.

CALFED developed six "solution principles" in consultation with cooperating agencies, stakeholders and interested public members. The solution principles were used to measure the overall acceptability of alternatives. The solution principles are:

1. **Reduce conflicts in the system:** Solutions will reduce major conflicts among beneficial uses of water.

2. **Be equitable:** Solutions will focus on solving problems in all problem areas. Improvement for some problems will not be made without corresponding improvements for other problems.
3. **Be affordable:** Solutions will be implementable and maintainable within the foreseeable resources of the Program and stakeholders.
4. **Be durable:** Solutions will have political and economic staying power and will sustain the resources they were designed to protect and enhance.
5. **Be implementable:** Solutions will have broad public acceptance and legal feasibility, and will be timely and relatively simple to implement compared with other alternatives.
6. **Pose no significant redirected impacts:** Solutions will not solve problems in the Bay-Delta system by redirecting significant negative impacts, when viewed in their entirety, within the Bay-Delta or to other regions of California.

Because of the history of conflict related to management of Bay-Delta resources, an essential element of CALFED is balance. The ultimate CALFED solution must balance the goals and objectives of the four resource areas and provide balanced benefits to all stakeholders. Accordingly, a solution to problems in one resource category cannot be pursued without addressing problems in the other resource categories. CALFED embodied this idea in the six solution principles.

Alternative Development

Phase I comprised a six-step process for the development of alternatives: identify problems, define objectives, identify actions, develop solution strategies, assemble alternatives, and refine alternatives. Early in Phase I, the Program identified 50 categories of actions to resolve Bay-Delta problems and achieve Program objectives. These action categories were drawn from existing literature and participation from CALFED agencies, BDAC, and numerous workshops with stakeholders and the general public. Within these categories, hundreds of individual actions were defined. The action categories represent the building blocks of the alternatives—that is, each alternative is a combination of action categories reflecting differing approaches to achieving Program objectives and addressing solution principles.

Given the large number of categories and the range of perspectives on solutions to Bay-Delta problems among stakeholders and CALFED agencies, thousands of potential alternatives could have been identified. A first step for the Program was to devise a methodology that would keep the number of alternatives to a manageable level while still representing the full range of approaches to resolving problems.

The methodology chosen to accomplish this was to define the critical conflicts that exist between beneficial uses and resources in the Bay-Delta and then to define approaches to resolving these conflicts. The following conflicts were identified:

- **Fisheries and Diversions.** The conflict between fisheries and diversions results primarily from fish mortality attributable to water diversions. This includes direct loss at pumps, reduced survival when young fish are drawn out of river channels into the Delta, and reduced spawning success of adults when migratory cues are altered. The effects of diversions on species of special concern have resulted in regulations that restrict the quantities and timing of diversions.
- **Habitat and Land Use and Flood Protection.** Habitat to support various life stages of aquatic and terrestrial biota in the Bay-Delta has been lost because of land development and construction of flood control facilities to protect developed land. The need for habitat affects land development planning as well as levee maintenance and planning. Efforts to restore the balance often require that land used for agricultural production be dedicated to habitat.
- **Water Supply Availability and Beneficial Uses.** As water use and competition for water have increased during the past several decades, conflict also has increased among users. A major part of this conflict is between the volume of in-stream water needs and out-of-stream water needs, and the timing of those needs within the hydrologic cycle.
- **Water Quality and Land Use.** Water quality can be negatively affected by land use, and ecosystem water quality needs are not always compatible with urban and agricultural water quality needs.

In assessing these conflicts, alternate approaches to conflict resolution and alternative levels of resolution were defined. Approaches for resolving the fisheries and diversions conflict included: (1) a fish productivity approach, and (2) a diversion modification approach. Approaches for resolving the habitat and land use and flood protection conflict included: (1) an existing land use pattern approach, and (2) a modified land use pattern approach.

Approaches for resolving the water supply availability and beneficial uses conflict included: (1) a demand reduction approach, and (2) a supply enhancement approach. Approaches for resolving the water quality and land use conflict included: (1) managing the quality of Delta inflows, and (2) managing in-stream water quality after discharges had occurred. Within each of these approaches, levels of conflict resolution ranging from less intensive to more intensive were identified.

This process produced 32 separate approaches to resolving the four conflicts. At this point, four teams of experts representing a variety of technical disciplines were formed—one team for each conflict area. These teams then were assigned an equal number of the 32 approaches (eight apiece), and directed to develop approximately three preliminary solution alternatives—sets of actions and action categories—for each of the eight approaches.

This procedure identified 100 preliminary solution alternatives that subsequently served as the foundation for the refinement process that defined the short list of three basic alternatives to be included in the Phase II analysis. In the Program's judgment, these 100 solution alternatives were representative of the larger number of possible combinations and bracketed the range of possible solutions to the four conflicts and, therefore, to the key problems facing the Bay-Delta. These "prototypical" alternatives helped demonstrate the advantages and disadvantages of a wider range of alternatives. In addition, the six previously mentioned solution principles guided the development of alternatives.

The 100 preliminary alternatives were very broad by design. Moreover, they tended to address the four critical conflicts in varying degrees—that is, they were not necessarily balanced in addressing Program objectives and solution principles.

At this point in the process, leadership responsibility for the four teams was moved from the technical experts to Program staff. This change was made to take advantage of staff's specific expertise on Bay-Delta issues and to more systematically include Program team members in the process, in order to ensure maximum sensitivity to the policies and positions of the CALFED agencies and stakeholder groups. The Program teams were instructed to begin balancing their alternatives, and to refine the initial set to approximately 6-10 per area by combining those alternatives with similar characteristics. This process produced a refined list of 31 alternatives.

Continued consolidation and balancing of the alternatives brought the number of alternatives to 20. These 20 alternatives were presented to stakeholders, BDAC members, and the public at a workshop. Consolidation and refinement based on input from that workshop produced the 10 alternatives described in the Program's April 1996 Phase I Progress Report. During April and May, the Program conducted 9 public meetings around the state, a workshop in Sacramento, and a meeting of the Bay-Delta Advisory Council to discuss the 10 alternatives.

The makeup of the alternatives during the process of refinement and development varied in the level of effort applied to actions related to ecosystem quality, water quality, system vulnerability, and water use efficiency. Levels of effort characterized as modest, moderate or extensive were applied to these four components. The two components that included distinctly different approaches were Delta Conveyance and water storage.

The comments received at the meetings and workshop cover a wide range of technical, policy, and financial concerns. Oral comments were generally consistent with comments contained in the over 160 letters received by the Program. Some of the comments prompted consideration of modifying the structure and presentation of the alternatives, as follows:

- **The best possible source water quality is of paramount importance to urban water supplies.** Agencies that deliver drinking water are very concerned about the

cost of meeting future drinking water quality standards, as well as the technical challenges associated with treating source water of degraded quality. This suggests strong pollutant source control measures in every alternative.

- **Delta levees will be needed to protect agriculture, infrastructure, and habitat no matter how water is conveyed in the Delta.** Delta levees protect many values, including farms, habitat, infrastructure, and Delta water quality. Even if a new conveyance facility is built that protects water quality for some export users, adequate levee integrity will still be required to protect water quality and many other values in the Delta. This argues for a similar level of Delta levee protection in each alternative.
- **Ecosystem actions at the modest and perhaps the moderate level appear inadequate; the Program needs a single coherent vision of ecosystem restoration.** The restoration of ecosystem functions and the recovery of Bay-Delta species likely will require diverse actions that will be extensive in scope. There is really no alternative to a single comprehensive plan for restoring ecosystem health. Adaptive management will be vital in guiding efforts to improve ecosystem quality. It is this adaptive management that will provide the needed flexibility in the Ecosystem Restoration Program.
- **Water use efficiency must be strongly pursued in all the alternatives.** This suggests that water use efficiency measures should be implemented at an increased level among all the alternatives, where previously some alternatives included efficiency at modest or moderate levels.

The above comments supported the conclusion that water use efficiency, water quality, levee system integrity, and ecosystem quality were necessary in each of the alternatives to achieve the Program's purpose and needed to be composed of the same actions in all alternatives. Although the goal is to implement each of these programs at the highest level to effectively achieve the Program's purpose, they will be implemented incrementally, or in stages, over time. This will provide flexibility for monitoring and adapting actions in response to the results of the initial actions.

Based on this information, the fundamental structure of the alternatives was simplified. At the end of Phase I, three basic alternative approaches, were formed around different configurations of Delta conveyance: existing system conveyance, modified through-Delta conveyance, and dual-Delta conveyance, which is formed around a combination of modified Delta channels and a new canal or pipeline connecting the Sacramento River in the North Delta to the SWP and CVP export facilities in the South Delta. Each included the same set of four programs that are common to all alternatives and involve water use efficiency, water quality, levee system integrity, and ecosystem quality ecosystem. A range of storage options for each alternative has been evaluated to support these programs and the Delta conveyance and to seek a balance between attainment of program objectives and cost

effectiveness.

The three basic alternative approaches from Phase I were carried into Phase II. The major tasks undertaken during Phase II to further refine the alternatives were:

- Added two Program elements (Water Transfer evolved as an outgrowth of the Water Use Efficiency Program, and Watershed arose from the Water Quality Program) to each alternative because of their value in helping the Program meet its multiple objectives.
- Refined the eight Program elements and associated actions.
- Developed strategies for implementing the alternatives.
- Developed 17 variations of the three basic alternative approaches to further explore potential refinements for storage and conveyance. These included three variations for Alternative 1, four variations for Alternative 2, and five variations for Alternative 3.
- Eliminated five variations from further consideration due to technical and other considerations.
- Evaluated the impacts of the 12 remaining variations in the March 1998 Draft Programmatic EIS/EIR.
- Eliminated some of the 12 variations for technical reasons and consolidated others.
- Considered public comments on the March 1998 Draft Programmatic EIS/EIR and additional technical analysis to redefine the three basic alternative approaches and develop a Preferred Program Alternative for evaluation in this report.

Looking simultaneously at all the information on how well the alternatives meet the objectives and how well they satisfy the solution principles would be nearly impossible due to the large amount of information. On the other hand, there are aspects that do differ among the alternatives and it is these aspects, or distinguishing characteristics, that guided the selection of the draft preferred alternative. The 18 distinguishing characteristics are: In-Delta Water Quality, Export Water Quality, Diversion Effects on Fisheries, Delta Flow Circulation, Storage and Release of Water, Water Supply Opportunities, Water Transfer Opportunities, Operational Flexibility, South Delta Access to Water, Risk to Export Water Supplies, Total Cost, Assurances Difficulty, Habitat Impacts, Land Use Changes, Socio-Economic Impacts, Consistency with Solution Principles, Ability to Phase Facilities, Brackish Water Habitat.

The preferred program alternative process began by examining how each of the twelve alternative variations performed when measured against the 18 distinguishing characteristics. This assessment revealed the comparative technical advantages of each alternative.

In the evaluation, two key distinguishing characteristics were particularly important in identifying how well the alternatives perform. Export Water Quality and Diversion Effects on Fisheries are highly dependent on the alternative selected. Therefore, irrespective of whether these two characteristics are the most important to selection of the preferred program alternative, they are the characteristics most dependent on that decision.

Based on the technical advantages, the dual Delta conveyance with an isolated facility appeared to provide greater technical performance than the other alternatives. Although some of the scientific and engineering evidence suggests that a dual-Delta conveyance configuration may improve export water quality and achieve fish recovery more effectively, other evidence indicates that such a conveyance configuration can cause in-Delta water quality problems. In addition, during scoping and public meetings, some stakeholders and agencies voiced concern that moving water around the Delta instead of through it may:

- Cause difficulty in ensuring the appropriate operation of such a facility.
- Create impacts from construction.
- Increase the amount of land needed for the facility.
- Provide an engineered solution when non-structural modifications and reoperation of existing facilities may provide similar benefits.

For all of the reasons noted above, the CALFED Program selected a Preferred Program Alternative which will initially develop a through-Delta conveyance based on the existing Delta configuration with some channel modifications.

However, there is concern whether a through-Delta conveyance approach can meet future water quality objectives and not adversely affect the recovery of threatened and endangered fish species. Accordingly, if the Program purposes cannot be fully achieved with the actions proposed in the Preferred Program Alternative, additional actions-including an isolated conveyance facility-may need to be added in the future. Such a facility would have to be demonstrated to be the most cost effective and least environmentally damaging alternative, and to be necessary for significantly advancing CALFED's commitment to seek continuous water quality improvement.

Until additional information is available to determine whether water quality objectives and fish recovery goals can be met and which, if any, additional actions will be necessary to achieve the Program goals and objectives, the Preferred Program Alternative is the best alternative to achieve overall project purposes and provide significant beneficial improvements over the conditions anticipated under the No Action Alternative, while establishing a process for obtaining this additional information. Moreover, the

way the alternatives are structured, going forward with the Preferred Program Alternative does not preclude the Program's ability to undertake additional conveyance actions in the future, subject to appropriate environmental review.

No long term plan for management of a system as complex as the Bay-Delta can predict exactly how the system will respond to our efforts, or foresee events such as earthquakes, climate change, or the introduction of new species to the system. Adaptive management acknowledges that we will need to adapt the actions that we take to restore ecological health and improve water management. These adaptations will be necessary as conditions change and as we learn more about the system and how it responds to our efforts. Pursuit of the Program's objectives will continue, but our actions may be adjusted over time to assure that the solution is durable. In essence, adaptive management calls for designing and monitoring actions such that they improve the understanding of the system while at the same time improving the system itself. Adaptive management is an essential part of implementing every CALFED Program element.

Staged implementation is central to the adaptive management process. The complexity of the CALFED Program contributes to the need for staged implementation. Staged implementation for the CALFED Preferred Program Alternative involves identifying certain actions for implementation for which there is general agreement and justification, and also identifying actions where uncertainty exists and developing conditions for moving beyond Stage 1. For the Program actions where uncertainty exists, certain predefined conditions would need to be met before action could proceed. The decision to proceed will be guided by a carefully crafted set of pre-defined conditions. Conditional decisions determine how the Program moves from stage to stage. "Conditional decisions" on several Program elements may be required at each stage of implementation.

In summary, CALFED set a Program purpose with the public; completed an alternative development process with public involvement; selected an alternative to meet the Project purpose with public involvement; rejected alternatives that did not satisfy the Project purpose, such as meeting only some of the Program objectives; and incorporated into the Preferred Alternative the means for reevaluating and adapting actions.

5.2 Program Alternatives will not meet water quality objectives

Improving water quality is very important in the CALFED Program, and is addressed in detail in the Water Quality Program Plan. The primary water quality objective of the Program is to "Provide good water quality for all beneficial uses." Among the four CALFED resource areas, problems and solutions related to water quality are perhaps the most varied. Good water quality means different things to different users, and there are different ways to achieve the objective. For instance, some constituents are of great concern to some water users, but of no concern for other users: organic carbon from Delta soils can form carcinogenic treatment byproducts in drinking water, but this carbon does not generally pose problems for ecosystem quality.

CALFED is committed to achieving continuous improvement in the water quality of the San Francisco Bay-Delta estuary. The Program's goals are two-fold: minimize ecological, drinking water and other water quality problems; and maintain water quality once achieved. The Program's strategy to achieve the water quality objective is to improve source water quality by reducing or eliminating parameters which degrade water quality. The Program's water quality sub-objectives concentrate on this direct source control approach. At the same time, the Program acknowledges that source control alone may not be the best or only strategy to achieve good water quality for all uses.

The CALFED drinking water objective is to continuously improve source water quality that allows for municipal water suppliers to deliver safe, reliable and affordable water that meets, and where feasible, exceeds applicable drinking water standards. The CALFED strategy for improving drinking water quality is to reduce the loads or impacts of bromide, total organic carbon, pathogens, nutrients, salinity, and turbidity through a combination of measures including source reduction, alternative water sources, treatment, and storage and conveyance improvements.

Water quality improvement is a key element of the ecosystem restoration strategy. CALFED's environmental water quality goal is to provide water in the San Francisco Bay-Delta of sufficient quality to protect all ecological beneficial uses of the water. Water use efficiency measures can improve water quality of water entering the Delta by reducing some agricultural and non-agricultural discharges containing pollutants. Water quality can affect the ability to expand water use efficiency measures such as conservation, water recycling, and conjunctive use. These measures depend on the availability of high quality water to prevent salt damage of irrigated land or groundwater basins, prevent corrosion of industrial equipment, and to achieve blended water salinity objectives. Watershed activities can improve water quality in the Bay-Delta system by helping to identify and control non-point sources of pollution and identify and implement methods to control or treat contaminants in the upper watersheds. CALFED has developed a Watershed Program that has strong linkages to the water quality improvement strategy. Surface and groundwater storage along with Delta conveyance improvements can help in the management of inflows to and exports from the Delta. These improvements could be used to improve drinking water quality. However, water quality improvements are possible only when dedicating system flexibility to this objective. The Integrated Storage Investigation will include more refinement and analysis of operational concepts for water quality improvement. In the event of a catastrophic levee failure in the Delta, the amount of saline water entering the system could make Delta waters unusable for many months; the saline water could also have a detrimental effect on habitat quality. Therefore, it is difficult to overestimate the importance of a successful Delta levee program to achieving and maintaining good water quality.

The Comprehensive Monitoring and Review Program will be the primary vehicle for measuring the extent to which continuous water quality improvement is achieved. Performance will be measured by comparing ambient water quality (where appropriate) to specific water quality objectives that have been established for the parameters of concern. For many water quality parameters, numerical or narrative objectives exist in water quality control plans adopted by the State Water Resources Control

Board and the Regional Water Quality Control Board. CALFED will use these objectives where appropriate as its targets for water quality improvement. The Water Quality Program Plan lists specific water quality targets to gauge its success; however, the Program will seek to achieve water quality that exceeds these targets where feasible and cost effective. At the same time, it is anticipated the periodic reevaluation of water quality targets will be a feature of adaptive management within this strategy.

Successfully meeting the water quality objectives depends on close coordination and collaboration among the Program, responsible State and Federal agencies and local agencies and interests. The Program will emphasize voluntary, cooperative incentive-based efforts to improve water quality, but the Program also will work with regulatory agencies to assure Program goals are accomplished where voluntary efforts prove insufficient.

5.3 Program Alternatives will not improve water supply reliability

- 4. The primary water supply reliability objective of the Water Management Strategy is to "Reduce the mismatch between Bay-Delta water supplies and current and projected beneficial uses dependent on the Bay-Delta system." Sub-objectives collectively increase water supply opportunities and reduce the conflict among beneficial water users, improve the ability to transport water through the system, and reduce the uncertainty of Bay-Delta system water supplies. The CALFED Program has proposed a Water Management Strategy to ensure water supply reliability that recognizes the variability of water supply and demand in California. CALFED's water supply reliability goals are to: increase the utility of available water supplies (making water suitable for more uses and reuses); improve access to existing or new water supplies in an economically efficient manner for environmental, urban and agricultural beneficial uses; and to improve flexibility of managing water supply and demand in order to reduce conflicts between beneficial uses, improve access to water supplies, and decrease system vulnerability. System improvements including improved Delta conveyance and new storage can create new water supply opportunities for all beneficial uses including ecosystem needs and consumptive uses.

The primary water supply reliability objective can be accomplished by addressing defined objectives, which collectively reduce the conflict among beneficial water users, improve the ability to transport water through the Bay-Delta system, and reduce the uncertainty of supplies from the Bay-Delta system. These objectives in summary form are:

1. Maintain an adequate water supply to meet expected in-Delta beneficial use needs.
2. Improve export water supplies to help meet beneficial use needs.
3. Improve the adequacy of Bay-Delta water to meet Delta outflow needs.
4. Reduce the vulnerability of Bay-Delta levees.
5. Improve the predictability of the water supply available from the Bay-Delta system for beneficial use needs.

The Integrated Storage Investigation will provide the analyses necessary for CALFED's determination

of the proper mix of groundwater and surface storage facilities, and CALFED's Water Management Strategy will rely heavily on these analyses as it identifies an appropriate combination of water management tools for attaining CALFED's water supply reliability goals and objectives.

5.4 Alternatives that did not meet all Program Objectives were not considered

As previously mentioned, the purpose of the Program is to develop and implement a long-term comprehensive plan that will restore ecological health and improve water management for beneficial uses of the Bay-Delta system. To achieve the Program purpose goals, CALFED's Preferred Program Alternative concurrently and comprehensively addresses the objectives of each of the four resource categories: ecosystem quality, water quality, water supply reliability and levee system integrity.

Through the alternative development process, alternatives not meeting all four objectives were either rejected or modified to include features that allowed the alternative to meet the Program's purpose of restoring ecological health and improving water management for beneficial uses of the Bay-Delta System.

Please consult Chapter 1 of the Programmatic Environmental Impact Statement/Environmental Impact Report (PEIS/EIR), Project Description, for information concerning the objectives and purpose of the CALFED Bay-Delta Program and a description of the Program alternatives development process. The Program alternatives and the Preferred Program Alternative are described in detail in Chapter 2 of the PEIS/EIR. Section 2.4 of the PEIS/EIR discusses the alternative variations that were not carried forward for further evaluation in this Draft Programmatic EIS/EIR. Please consult the Implementation Plan and Comprehensive Monitoring and Assessment Review Program Report appendices to the PEIS/EIR for more detailed discussion of Adaptive Management. Specific drinking water quality targets can be found in Section 3.4 of the Revised Phase II Report as well as Chapter 3 of the Water Quality Program Plan Appendix to the PEIS/EIR. Appendix C of the Water Quality Program Plan lists specific water quality targets to gauge its success. Please refer to the Revised Phase II Report Appendix; Chapter 5.1 of the PEIS/EIR; and Common Responses 2, 4, and 6 for a more detailed discussion of CALFED's plan to meet water supply reliability objectives. Please consult Common Response 1 for a discussion of the programmatic nature of the document, Common Response 4 for a discussion of water storage in the CALFED Program (Program), Common Response 14 for a discussion of water quality in the Program, and Common Response 16 for a discussion of the Isolated Facility/Peripheral Canal.

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