DRAFT

Water Use Efficiency Common Program

March 6, 1997

CALFED
BAY-DELTA
PROGRAM

TABLE OF CONTENTS

EXECUTIVE SUMMARY 3

I. INTRODUCTION 8

Public Policy Foundations
Water Use Efficiency in the Bay-Delta System Today
The Basis for a CALFED Water Use Efficiency Common Program
Development of the Water Use Efficiency Common Program
Program Linkages

II. IMPLEMENTATION OBJECTIVES 12

General Objectives
Urban Objectives
Agricultural Objectives

III. GENERAL ASSURANCES 15

New Water
Water Transfers
Drought Water Bank

IV. AGRICULTURAL WATER USE EFFICIENCY APPROACH 17

Water Management Planning and Implementation
Technical and Planning Assistance
Funding Assistance
Management Improvements to Achieve Multiple Benefits
Assurances for Agricultural Water Use Efficiency

V. URBAN WATER USE EFFICIENCY APPROACH 22

Conservation Implementation, Reporting, and Certification
Certification of Water Management Planning
Technical and Planning Assistance
Funding Assistance
Assurances for Urban Water Management and Conservation

VI. APPROACH TO EFFICIENT USE OF DIVERTED ENVIRONMENTAL WATER .. 27

VII. WATER RECYCLING APPROACH

[Note: This approach will be developed in coordination with appropriate CALFED agencies and consultation with stakeholders and the public, including the Water Use Efficiency Work Group.]

VIII. WATER TRANSFERS

[Note: This approach will be developed in coordination with appropriate CALFED agencies and consultation with stakeholders and the public, including the Water Use Efficiency Work Group.]

EXECUTIVE SUMMARY

The CALFED Bay-Delta Program is developing a long-term comprehensive plan to restore ecological health and improve water management for beneficial uses of the Bay-Delta system, including a program to ensure that California's water supplies are used efficiently. The water use efficiency program is in keeping with California public policy, which places a strong emphasis on efficient use of developed water supplies. At CALFED scoping sessions, participants expressed a strong sentiment that water use efficiency should figure prominently in all the CALFED alternatives, and that existing supplies must be used efficiently before we undertake costly efforts to develop additional supplies or improve the ability to convey water across the Delta.

Many local water agencies in California have strong water use efficiency programs. The greatest current challenge in water use efficiency is finding ways to encourage more water users and water suppliers to implement the proven cost-effective efficiency measures that are being used successfully by their peers throughout the state.

The term efficiency may be defined in different ways. Increases in physical efficiency and increases in the achievement of CALFED objectives through improved water management will be direct results of the water use efficiency program. Increasing economic efficiency -- which might result in a reallocation of water -- is not a specific objective of the Program but will likely be an indirect result.

The CALFED water use efficiency program differs from other components of a Bay-Delta solution in two fundamental ways: it is concerned with policy, not technical, issues, and most actions will be implemented by local agencies rather than CALFED agencies.

Implementation objectives were established in order to guide the development of approaches for water use efficiency. These objectives are intended to reflect and protect the various stakeholder interests regarding local water use management and efficiency. The objectives were used during program development to test whether a draft approach was satisfactory. There are general objectives as well as specific objectives for urban water conservation and agricultural water use efficiency. General objectives include:

- Ensure a strong water use efficiency component in the Bay-Delta solution.
- Emphasize incentive based actions over regulatory actions.
- Preserve local flexibility.
- Remove disincentives and barriers to efficient water use.

- Offer greater help in the planning and financing of local water use management and efficiency improvements.

Objectives that relate to urban water use efficiency improvements include:

- Include the strengths and benefits of the CUWCC and the urban MOU.
- Provide assurance that a high "floor" level of conservation implementation will occur.

Objectives that relate solely to agricultural local water use management and efficiency improvements include:

- Build on the progress and achievements of the *Memorandum of Understanding Regarding Efficient Water Management Practices by Agricultural Water Suppliers in California* (AB 3616).
- Provide adequate assurance that agricultural water supplies will be used at highly efficient levels.
- Improve local water use management to achieve multiple benefits.

The CALFED solution alternatives must provide assurance that appropriate water management planning is carried out by local agencies and that cost-effective efficiency measures are implemented. Demonstration of appropriate planning and implementation will be necessary prerequisites for an agency to be eligible to:

- receive any "new" water made available by a Bay-Delta solution,
- participate in a water transfer that requires approval by any CALFED agency or use of facilities operated by any CALFED agency, and
- receive water through the DWR Drought Water Bank. (This is already a policy of DWR.)

Agricultural Water Use Efficiency Actions

The agricultural approach recognizes a clear standard for voluntary agricultural water management planning and a balanced process for recognition of adequate programs of planning and implementation. The approach is supported by planning and technical assistance, financing assistance, and proposed assurances. The approach includes the following:

1. Water Management Planning and Implementation

All agricultural water suppliers should prepare, adopt, and implement water management plans. The *Memorandum of Understanding Regarding Efficient Water Management Practices by*

Agricultural Water Suppliers in California (Agricultural MOU) provides a uniform, verifiable, locally directed process for agricultural water management planning and provides a process for balanced review and endorsement of plans and implementation progress reports.

2. Technical and Planning Assistance

Technical and planning assistance is vital to the successful achievement of agricultural water use efficiency. Both DWR and USBR will continue to provide technical and planning assistance. Assistance programs will be expanded as necessary to ensure that lack of technical and planning expertise does not impede implementation of cost-effective measures.

3. Funding Assistance

Funding assistance is an integral part of the successful achievement of agricultural water use efficiency. CALFED will make flexible funding assistance programs available to ensure that lack of financing ability does not impede implementation of cost-effective measures.

4. Management Improvements to Achieve Multiple Benefits

CALFED agencies will work to meet Bay-Delta Program objectives, including those related to ecosystem quality and water quality, by encouraging districts to identify opportunities for improvement when preparing water management plans, and by creating incentives for implementation of actions that meet CALFED objectives and priorities.

5. Assurances for Agricultural Water Use Efficiency

The agricultural water use efficiency approach relies heavily on a voluntary planning and implementation process. A proposed mechanism is included to provide stronger assurance that agricultural water supplies are used at highly efficient levels. If the voluntary process does not meet defined implementation criteria, then CALFED agencies will work to establish legislative and regulatory policies for agricultural water users that are patterned after existing urban water management planning elements of the Water Code. This proposed assurance mechanism will be considered together with all other Program assurance needs in developing a final package of assurances.

Urban Water Conservation Actions

The urban approach recognizes a clear standard for implementation of cost-effective conservation measures and responsibility to carry out local water management planning. The approach establishes a process for recognition of adequate planning efforts and recommends a

balanced process for recognition of adequate conservation implementation. The approach is supported by planning and technical assistance, financing assistance, and proposed assurances.

1. Conservation Implementation, Reporting, and Certification

The *Memorandum of Understanding Regarding Urban Water Conservation in California* (Urban MOU) provides a uniform, verifiable, locally directed process for implementation of cost-effective urban water conservation programs. All urban water suppliers should implement conservation programs that comply with the terms of the Urban MOU. CALFED recommends that the California Urban Water Conservation Council adopt a process for endorsement or certification of water supplier compliance with the terms of the Urban MOU.

2. Certification of Water Management Planning

California's Urban Water Management Planning Act requires urban water suppliers to prepare and adopt Urban Water Management Plans and update them every 5 years. DWR evaluates the plans. This evaluation process will be formalized to include a certification process for plans that comply with the terms of the Act.

3. Technical and Planning Assistance

Technical and planning assistance is vital to the successful implementation of cost-effective conservation programs. DWR and USBR will continue to provide technical and planning assistance. Assistance programs will be expanded as necessary to ensure that lack of technical and planning expertise does not impede implementation of cost-effective measures.

4. Funding Assistance

Funding assistance is an integral part of the successful achievement of urban water use efficiency programs. CALFED will make flexible funding assistance programs available to ensure that lack of financing ability does not impede implementation of cost-effective measures.

5. Assurances for Urban Water Management and Conservation

The Urban Water Management Planning Act and the Urban MOU provide recognized standards for minimum implementation of cost-effective urban water conservation programs. CALFED recommends that the California Urban Water Conservation Council adopt a process for endorsement or certification of water supplier compliance with the terms of the Urban MOU. A process of certification coupled with sanctions for failure to comply with the terms of the Urban MOU will help assure that appropriate cost-effective measures are being implemented. This

proposed assurance mechanism will be considered together with all other Program assurance needs in developing a final package of assurances.

Efficient Use of Environmental Diversions

In addition to the broad categories of urban and agricultural water needs, there are important environmental needs for adequate water supplies. Policies related to efficient use of environmental diversions are being examined in the context of the water use efficiency program. Three CALFED agencies are working with other organizations to develop an Interagency Coordinated Program for optimum water use planning for wetlands of the Central Valley. This program will identify Best Management Practices for refuge water management and will develop a water use management planning process for refuge and wetland areas of the Valley. The Interagency Coordinated Program will work closely with, and coordinate with, CALFED to assure consistency of policy and solution principles, meet the general implementation objectives for water use efficiency, and propose mechanisms that assure the efficient use of water on refuges, wildlife areas, and managed wetlands.

I. INTRODUCTION

The CALFED Bay-Delta Program is developing a long-term comprehensive plan to restore ecological health and improve water management for beneficial uses of the Bay-Delta system. Three alternatives to accomplish this mission are being refined and analyzed during Phase II of the Program. These alternatives share a "common program" of measures to ensure that California's water supplies are used efficiently. This common program of measures is the water use efficiency component. The water use efficiency component focuses on improvements in local water use management and efficiency in the urban, agricultural, and diverted environmental (e.g., wetlands, refuges) water use sectors.

Public Policy Foundations

California public policy places a strong emphasis on efficient use of developed water supplies. The California Constitution (Article X, Section 2) prohibits "waste or unreasonable use" of water and excludes from water rights any water that is not reasonably required for beneficial use. The constitutional prohibitions of waste and unreasonable use are repeated in Sections 100 and 101 of the California Water Code. The state's process for appropriation of water rights is also based on furtherance of the constitutional policy of reasonable and beneficial use (Water Code Section 1050). The State Water Resources Control Board can and does place water conservation conditions on water rights permits that it approves.

The California Water Code requires all urban water suppliers to prepare and adopt urban water management plans and requires first consideration be given to demand management measures that offer lower incremental costs than expanded or additional water supplies (Water Code Section 10610 *et seq.*) The Code previously placed limited planning requirements on agricultural water suppliers, but these provisions have expired as a result of legislative sunset provisions (Water Code Section 10800 *et seq.*)

State and federal water projects are also affected by efficiency requirements. The Central Valley Project Improvement Act calls for the development of water conservation criteria "with the purpose of promoting the highest level of water use efficiency reasonably achievable by project contractors." Some State Water Project contracts contain conservation requirements, and some water right permits granted to the State Water Project by the State Water Resources Control Board contain specific conservation requirements.

Efforts by the State Water Resources Control Board to place more specific efficiency conditions on water right permits have also led to innovative voluntary efforts. Proposed efficiency requirements in the Board's draft 1988 Water Quality Control Plan for the Bay-Delta prompted efforts which ultimately resulted in the creation of the California Urban Water Conservation

Council and implementation of urban Best Management Practices by many urban agencies. The board's draft plan also prompted the negotiation of the *Memorandum of Understanding Regarding Efficient Water Management Practices by Agricultural Water Suppliers in California.*

Water Use Efficiency in the Bay-Delta System Today

California's strong public policy emphasis on efficiency, and Californians' strong conservation ethic, are reflected in many outstanding water use efficiency and water conservation efforts throughout the state. California irrigation districts and growers have implemented pioneering methods to manage water supplies and improve efficiency. These methods range from canal control and improved flexibility of deliveries to new irrigation system technology to drainage reduction to computerized information on crop water needs. Similarly, urban water suppliers have worked with public interest groups to create the California Urban Water Conservation Council, a nationally recognized forum for the successful advancement of our understanding and implementation of urban water use efficiency measures.

The greatest current challenge in water use efficiency is finding ways to encourage more water users and water suppliers to implement the proven cost-effective efficiency measures that are being used successfully by their peers throughout the state.

The Basis for a CALFED Water Use Efficiency Common Program

The CALFED Bay-Delta Program will develop a long-term solution to problems affecting the San Francisco Bay/Sacramento-San Joaquin Delta. The Program addresses four categories of Bay-Delta problems: ecosystem quality, water quality, water supply reliability, and system integrity. Efficient use of developed water supplies can contribute to solution of problems in several of these categories. Clearly, water use efficiency can help to achieve the Program's goal for water supply reliability: *Reduce the mismatch between Bay-Delta water supplies and current and projected beneficial uses dependent on the Bay-Delta system.* In addition, changes in local water management, compatible with intended beneficial uses, can help achieve other objectives of the Program by improving water quality or enhancing ecosystem health.

During April and May of 1996 a series of public scoping meetings and workshops were held to explain the CALFED Program solution alternatives under consideration at that time and to solicit comments from the public about these alternatives. Citizens from all parts of the state expressed strong support for water use efficiency. There is a strong sentiment that water use efficiency should figure prominently in all the alternatives, and that existing supplies must be used efficiently before we undertake costly efforts to develop additional supplies or improve the ability to convey water across the Delta.

Based on the many comments received, the Program created a simplified structure for the Bay-Delta solution alternatives in which several components are very similar among all the alternatives. Water use efficiency, water quality, levee system integrity, and ecosystem restoration are all treated as common programs. For water use efficiency, this means that all three of the alternatives refined and analyzed during Phase II of the Program will include very similar approaches to assure that cost-effective efficiency measures are widely implemented. The variable components (Delta conveyance and additional storage) will influence which of these efficiency measures will be cost-effective.

Development of the Water Use Efficiency Common Program

Efficiency has several definitions. One is a traditional view of water use efficiency defined in terms of physical efficiency: the ratio of water consumed to water applied. Efficiency can also be defined in economic terms: deriving the greatest economic output from a given input such as a unit of water. For the purpose of developing and implementing a water use efficiency common program, CALFED has defined efficiency somewhat differently: **efficient water use refers to the implementation of local water management actions that increase the achievement of CALFED goals and objectives.** This definition includes physical efficiency but is not limited to this narrow definition.

Increases in physical efficiency and increases in the achievement of CALFED objectives through improved water management will be direct results of the Program. Increasing economic efficiency -- which might result in a reallocation of water -- is not a specific objective of the Program and the Program will not take direct action to increase economic efficiency. However, Program actions that facilitate a water transfers market will likely result in improved economic efficiency.

Program Linkages

There are important linkages between water use efficiency and other components of a comprehensive long-term solution to resource problems of the Bay-Delta. Some of these include:

- **Storage and conveyance.** The cost of new storage and conveyance projects will help set the marginal cost of new supplies for many water suppliers. This, in turn, will influence the cost-effectiveness of efficiency measures: if new supplies are expensive, then more efficiency measures will be cost-effective.

- **Delta transfer capacity.** The increase in physical capacity to transfer water across the Delta that may result from new or improved conveyance will be important in determining the maximum extent of water transfers across the Delta.

- **Water Quality.** Increases in irrigation efficiency can reduce the amount of tailwater that drains from a farm field. This may improve in-stream water quality by reducing the return flow of salts, sediments, organic carbon, selenium, or other substances.

- **Ecosystem Quality.** Increased emphasis on efficiency measures will reduce future Bay-Delta system water diversions from what they would be without the implementation of these additional efficiency measures. This will reduce the level of future impacts on aquatic organisms.

- **Financing.** The way that costs of a Bay-Delta solution are apportioned will have significant effects on the cost-effectiveness of efficiency measures. To the extent that the costs of actions such as providing water for ecosystem restoration are reflected in the price that agencies and consumers pay for water, efficiency measures will be made more attractive.

The physical scope of water use efficiency actions is limited to improvements that can affect Bay-Delta water supplies (surface and subsurface) from points of local diversion for beneficial use to points of local return to the receiving water. This scope focuses on opportunities that are implementable at the local water supplier and end-user level. For instance, changing the timing of diversion, reducing demand through conservation and recycling, or improving the quality of a return flow are actions related to beneficial use of local diversions and are implementable at the local and end-user levels. Reservoir operation, upper watershed management, and instream flow standards typically would not fit within the scope of water use efficiency, although these issues will be integral to a comprehensive CALFED Bay-Delta solution.

CALFED's water use efficiency component must also be compatible with the solution principles that the program has identified to guide development of a Bay-Delta solution. These principles state that a Bay-Delta solution must:

- Reduce conflicts in the system
- Be equitable
- Be affordable
- Be durable
- Be implementable
- Not exhibit significant redirected impacts

The CALFED water use efficiency program differs from other components of a Bay-Delta solution in two fundamental ways. First, the proposed program approaches water use efficiency strictly from a policy perspective. In contrast to all other components of the program, no technical issues are addressed. Technical questions such as those related to appropriate efficiency measures and implementation levels are left to other forums including the California Urban Water Conservation Council and the Agricultural Water Management Council. Second, implementation of efficiency measures will occur mostly at the local and regional level by local agencies, not by the State and federal CALFED agencies.

The role of CALFED agencies will be twofold. First, they will offer support and incentives such as programs to provide planning, technical, and financing assistance. Second, the CALFED agencies will play an important role in providing assurances that cost-effective efficiency measures will be implemented.

The water use efficiency component is divided into five elements to facilitate discussion and development of CALFED Program approaches: urban water use, agricultural water use, diverted environmental water use, water recycling, and water transfers. The first three elements correspond to traditional water use sectors of urban, agriculture, and the environment. Some differences in the water use efficiency approach for each sector may be appropriate because there are differences in water rights, type and method of water use, and potential for reuse. Water recycling will be treated separately for the sake of expediency, because urban water recycling has traditionally been approached separately from urban water conservation, and is often the responsibility of different agencies. Water transfers, which are fundamental to state and federal water policies, are not strictly efficiency measures but they may prompt the implementation of efficiency measures or in some cases provide the funding for efficiency measures on a local basis.

A work group of the Bay-Delta Advisory Council was established to address policy issues related to efficient water use and to assist in development of draft approaches to efficiency. The Water Use Efficiency Work Group has provided considerable input to CALFED during development of the common program and has served as a public forum for discussion of the program during development.

II. IMPLEMENTATION OBJECTIVES

Implementation objectives were established in order to guide the development of approaches for water use efficiency. These objectives are intended to reflect and protect the various stakeholder interests regarding local water use management and efficiency. The objectives were used during program development to test whether a draft approach was satisfactory.

General Objectives. These objectives apply to the entire Water Use Efficiency Common Program.

- **Ensure a strong water use efficiency component in the Bay-Delta solution** - During the CALFED scoping period and at numerous public meetings, the general public as well as stakeholders said local water use management and efficiency improvements should play an integral role in the Bay-Delta solution.

- **Emphasize incentive based actions over regulatory actions** - The CALFED Program's approach to water use efficiency emphasizes incentives to encourage efficient use. Principal incentives include planning, technical, and financing assistance to local water agencies. Additional incentives include access to potential benefits of the Bay-Delta Program such as increased water supplies and increased ability to convey transferred water. Regulatory actions provide necessary assurances of efficient use as well as mitigation for third party impacts that may result from incentive-based approaches.

- **Preserve local flexibility** - During the CALFED Bay-Delta Program's scoping period and at numerous public meetings, stakeholders stressed the desire to maintain the flexibility of implementing water use management and efficiency improvements at the local level. The CALFED Program's approach to local water use management and efficiency provides necessary assurances of improved efficiency while maintaining the flexibility to tailor implementation to local conditions.

- **Remove disincentives and barriers to efficient water use** - Water agencies and water users may be discouraged from implementing conservation measures as a result of various disincentives. Examples of disincentives include poorly planned water wholesaler drought water allocation plans, negative impacts to agency operation budgets resulting from reduced water sales, and inability to pass some conservation costs along to customers (as occurs with some investor owned utilities). Removal of disincentives can allow agencies and their customers to implement conservation measures that otherwise could not be justified. However, removal of barriers must support the original purposes of the institutions associated with the measure.

- **Offer greater help in the planning and financing of local water use management and efficiency improvements** - To implement efficient water management practices, some water users need information about proposed measures and may also need the ability to finance implementation of such measures. Greater levels of technical, planning, and financing assistance are essential to improve local water use management and efficiency. This assistance will help agencies use integrated resource planning methods and common approaches to cost-effectiveness determinations, will help agencies recognize the value of

conservation, and will allow them to make more informed decisions regarding implementation of such measures.

Urban Objectives. The objectives presented in this subsection relate to urban water use efficiency improvements.

- **Include the strengths and benefits of the CUWCC and the urban MOU** - The California Urban Water Conservation Council (CUWCC) has an established role in the urban water use community relating to the implementation of BMPs. The CUWCC consists of water agencies, environmental and public interest groups, and other interested parties that have signed the *Memorandum of Understanding Regarding Urban Water Conservation in California* (MOU). The strengths of the CUWCC include: ability to foster collaboration among diverse urban agencies and the non-profit community; development of a framework for implementation of urban BMPs; the ability to update BMPs to reflect advances in technology and knowledge in the area of urban conservation; and its ability to allow a signatory agency to exempt itself from a specific BMP given proof of non-cost effectiveness. The urban MOU and the urban water management planning sections of the Water Code represent important accomplishments in urban water management.

- **Provide assurance that a high "floor" level of conservation implementation will occur** - The conservation measures that are most likely to be cost-effective for urban water suppliers are well known. These Best Management Practices are appropriate for almost every agency and define an easily-understood minimum level of conservation effort. Many agencies are implementing BMPs at appropriate levels, but many others are not. The approach to urban water use efficiency must achieve a higher level of BMP implementation, and by more agencies, in order to be credible.

Agricultural Objectives. The objectives presented in this subsection relate solely to agricultural local water use management and efficiency improvements.

- **Build on the progress and achievements of the *Memorandum of Understanding Regarding Efficient Water Management Practices by Agricultural Water Suppliers in California* (AB 3616)** - The AB 3616 process has resulted in an agricultural MOU that emphasizes uniform analysis of efficient water management practices, provides a standardized format for water management plans, and calls for implementation of district level measures that meet criteria contained in the MOU. It, along with recent CVPIA conservation criteria, represent important accomplishments in agricultural water management.

- **Provide adequate assurance that agricultural water supplies will be used at highly efficient levels** - A central tenet of the CALFED process is that all interests will move forward together. As planning for possible improvements in water conveyance and storage moves forward, it will be important for stakeholders and taxpayers to be assured that existing water supplies are being used as efficiently as practical at all levels. The approach taken must provide the information and include the actions to offer this assurance.

- **Improve local water use management to achieve multiple benefits** - Opportunities exist to manage local water use for multiple benefits without adversely affecting any of the users. Examples of these opportunities include development of conjunctive use programs; coordination of releases to correspond with fishery, water quality, and agricultural needs; and changes in water management that help support wildlife habitat. The program will seek improvements that not only promote water use efficiency but also benefit other resource areas. The program will encourage improved local water use management and efficiency at all levels, from field to basin-wide so that all opportunities for local management and efficiency improvements are identified and the relationships among water uses within a basin are understood.

III. GENERAL ASSURANCES

The CALFED Bay-Delta Program solution alternatives will include a variety of programs, policies, and actions to provide assurance that appropriate water management planning is carried out by local agencies and that cost-effective efficiency measures are implemented. Some specific assurance mechanisms and assurance needs are described in the sections that follow. In addition, CALFED and the CALFED agencies will implement three general policies to provide assurance of efficient use. Demonstration that appropriate water management planning is being carried out and that cost-effective efficiency measures are being implemented will be necessary prerequisites for an agency to be eligible to:

- receive any "new" water made available by a Bay-Delta solution,
- participate in a water transfer that requires approval by any CALFED agency or use of facilities operated by any CALFED agency, and
- receive water through the DWR Drought Water Bank (this is already a policy of DWR).

For urban water suppliers, this demonstration will include DWR certification of the supplier's urban water management plan and updates, and California Urban Water Conservation Council certification of the supplier's compliance with the terms of the Urban MOU. For agricultural water suppliers, this demonstration will include Agricultural Water Management Council endorsement of the supplier's water management plan and implementation progress reports.

New Water

A Bay-Delta solution alternative implemented by the CALFED agencies may produce new or expanded water supplies for all beneficial uses. In order to be eligible to receive any additional water made available, local and regional water suppliers must demonstrate that they are carrying out appropriate water management planning and that they are implementing cost-effective efficiency measures.

The planning and implementation required in order to be eligible for new water supplies are water management activities that all water suppliers should implement regardless of their need for any additional water. Therefore, it is appropriate to define "new or expanded water supplies" in the broadest possible terms. At minimum, new or expanded water supplies will include any supply greater than that which can be delivered under the 1994 Bay-Delta Accord and the Water Quality Control Plan adopted by the State Water Resources Control Board on May 22, 1995.

Water Transfers

A Bay-Delta solution alternative implemented by the CALFED agencies may increase the ability to transfer water, through reduction in physical conveyance constraints in the Delta or other policy changes. If a transfer requires use of DWR or USBR facilities, or requires approval from any CALFED agency, then both the transferring and receiving agency must demonstrate that they are carrying out appropriate water management planning and that they are implementing cost-effective efficiency measures.

Drought Water Bank

The Department of Water Resources periodically operates a drought water bank to facilitate short-term water transfers to meet critical water needs during severe water-short periods. It is currently the policy of DWR, expressed in the *State Drought Water Bank Program Environmental Impact Report* dated November 1993, that "transfers will only be made to areas where the water supply agency has implemented reasonable and cost effective management and water recycling programs..." In order to receive water from a Drought Water Bank, local and regional water suppliers must demonstrate that they are carrying out appropriate water management planning and that they are implementing cost-effective efficiency measures.

In the urban sector, retail water agencies often receive water supplies from wholesale water agencies. As a result, application of the above conditions would affect wholesalers but not necessarily retailers. To make these general assurances effective, any new, transferred, or Drought Water Bank water will be reduced in quantity proportional to the number and size of non-certified retailers in the wholesaler's service area, or the cost of water will include a

surcharge proportional to the number and size of non-certified retailers. This may require new regulations or legislation.

IV. AGRICULTURAL WATER USE EFFICIENCY APPROACH

Agriculture is an important part of California's economy. This $20-billion-a-year industry produces about 11 percent of the total U.S. agricultural value and 40% of the nation's produce on 9.1 million irrigated acres. The CALFED Bay-Delta Program, by solving interrelated problems of the Bay-Delta system, will help to preserve the viability of agriculture in California. The Program's approach to agricultural water use efficiency will be to encourage cost-effective water use efficiency measures and to achieve other CALFED Program objectives in ways that are compatible with agriculture.

In the case of agricultural water suppliers, the number of efficiency improvements that are cost-effective at the local level is highly constrained by different soil types, growing conditions, market volatility, and other factors. Distribution costs, reflected in the costs of water for districts and users, are far lower for agriculture than for urban agencies because the water is normally not treated or pressurized. Consequently, some efficiency measures will not be cost-effective for districts or users, and some cost-effective measures will not be affordable without financing assistance. However, many water use efficiency actions, such as irrigation scheduling, are implemented by end users without assistance from water suppliers.

In addition, the identification of agricultural efficiency and water use management improvements is complicated. In contrast to many urban agencies, much of the water applied to crops that is excess to plant needs is reused, whether via return flows, deep percolation, or flow to neighboring farms or wetlands. Although excess applications can generate benefits, they can also create negative impacts such as additional fish entrainment or degradation of water quality. Opportunities for improvements are often site-specific, which reduces the practicality of using broadly mandated requirements in an approach. Use of a flexible approach with a focus on incentives is more likely to help identify and implement desired improvements.

In the agricultural sector, the nature and extent of benefits from improvements in local water use management and efficiency might differ from the perspective of a field, farm, irrigation district, or basin. If the perspective is broadened to include environmental and water quality benefits as well as water supply benefits, then additional measures might become available to improve efficiency in the broader sense of meeting CALFED Program objectives. The CALFED Program agricultural water use efficiency approach is designed to identify diverse opportunities for local water use management and efficiency improvements and increase the benefits that can be derived from a unit of water. The program will look to water management techniques that increase the effectiveness of water use management and efficiency at the field, farm, district, and basin level

where these are appropriate. In addition, the Program will support measures that cost-effectively increase agricultural production from a unit of water, protect water quality, or increase environmental benefits while meeting agricultural needs.

Agricultural Water Use Efficiency Actions

The agricultural approach recognizes a clear standard for voluntary agricultural water management planning and a balanced process for recognition of adequate programs of planning and implementation. The approach is supported by planning and technical assistance, financing assistance, and proposed assurances.

1. Water Management Planning and Implementation

Purpose: Provide a uniform, verifiable, locally directed process for agricultural water management planning. Provide a balanced process for review and endorsement of water management plans. Identify and implement opportunities for improved local water use management and efficiency with a focus on water conservation at the water supplier level.

This action is based on the *Memorandum of Understanding Regarding Efficient Water Management Practices by Agricultural Water Suppliers in California* (Agricultural MOU). This MOU is an agreement between signatory agricultural water suppliers and signatory environmental organizations. It was developed by an advisory committee formed pursuant to California State legislation in 1990. The bill number of the legislation was AB 3616, so the MOU and the process that produced it are sometimes referred to by this bill number. The agreement calls for signatory water suppliers to prepare water management plans and submit these plans to a Council composed of representatives of all MOU signatories, including water suppliers and environmental organizations. This Council endorses, or withholds endorsement, of each water management plan. Signatory water suppliers also agree to submit annual implementation progress reports to the Council. The MOU calls for water suppliers to implement certain measures called Efficient Water Management Practices, and to evaluate other Efficient Water Management Practices according to a specified analysis method, implementing those found to be feasible and cost-effective.

The CALFED Program proposes that all agricultural water suppliers should prepare, adopt, and implement water management plans. This is consistent with public policy, state law, and public comments made during scoping for the CALFED Bay-Delta Program. The Agricultural MOU provides a uniform, verifiable, locally directed process for agricultural water management planning.

In addition, the Agricultural MOU provides a process for balanced review and endorsement of plans and implementation progress reports that meet the standards of the MOU. All agricultural water suppliers should submit plans and implementation reports to the Agricultural Water Management Council formed under the terms of the Agricultural MOU for endorsement. Plans may be those prepared by signatory or non-signatory water suppliers which meet the terms of the Agricultural MOU, or conservation plans prepared by Central Valley Project contractors pursuant to the Water Conservation Criteria prepared by the U.S. Bureau of Reclamation.

This part of the water use efficiency common program is supported by proposed assurances. Please see Action 5 below.

2. Technical and Planning Assistance

Purpose: Ensure that lack of technical and planning expertise does not impede implementation of cost-effective measures by providing easily accessible assistance for planning and implementing local water use management and efficiency improvements.

Technical and planning assistance is vital to the successful achievement of agricultural water use efficiency. Assistance can be directed either at *identification* of opportunities (water management planning, guidebook development, conservation program planning) or at *implementation* of opportunities (short courses, CIMIS irrigation schedules, mobile labs, technical review). Currently, both DWR and USBR provide this kind of assistance directly to their contractors as well as to other water suppliers. Agencies such as the Cooperative Extension and the U.S. Department of Agriculture also provide assistance, including programs directed at water management and efficiency improvements. Under this action, both DWR and USBR will continue to provide technical and planning assistance. Assistance programs will be expanded as necessary to ensure that lack of technical and planning expertise does not impede implementation of cost-effective measures.

Additional assistance may be provided through local programs operated by Resource Conservation Districts, commodity groups, the Agricultural Water Management Council, or water districts themselves.

3. Funding Assistance

Purpose: Ensure that lack of financing ability does not impede implementation of cost-effective measures. Provide easily accessible funding for planning and implementing local water use management and efficiency improvements.

Funding assistance is an integral part of the successful achievement of agricultural water use efficiency. CALFED will facilitate the implementation of local water use management and efficiency improvements by making available flexible funding assistance programs. Funding assistance for water suppliers and end-users, such as existing programs available through DWR, USBR, EPA and others, will continue under this action. Determination of most appropriate programs and levels of funding will be made in coordination with CALFED agencies, consistent with the principle that lack of financing ability should not impede implementation of cost-effective measures. Examples of funding programs include low interest loans, grants, direct financing, rebate programs, and bond pooling.

Funding assistance may be made available directly through State or federal agencies or through regional cooperative groups (e.g. Resource Conservation Districts, Cooperative Extensions, commodity boards), to local water suppliers or individual water users.

4. Management Improvements to Achieve Multiple Benefits

Purpose: Help to meet CALFED objectives, including those related to ecosystem quality and water quality, by encouraging districts to identify opportunities for improvement when preparing water management plans, and creating incentives for implementation.

The planning process described in the Agricultural MOU includes completion of a net benefit analysis which, among other things, will help districts identify environmental benefits and impacts associated with the implementation of Efficient Water Management Practices. Use of the net benefit analysis creates an opportunity for districts to simultaneously identify other local water use management and efficiency improvements which might meet CALFED objectives by improving water quality or ecosystem health. In many instances, it is not cost-effective for local suppliers or water users to implement or even identify opportunities that address these benefits. Yet, from a regional or statewide perspective, implementation of these types of actions can be justified. If additional technical and planning assistance could be provided to districts while they are conducting the net benefit analysis, it would offer an excellent chance to identify additional actions that might improve water quality or ecosystem health.

Incentive payments could be used to encourage implementation of practices that meet CALFED objectives and yield environmental, water quality, or water supply benefits but which are not cost-effective at the local water supplier or water user level. The amount of the incentive payment would need to be sufficient to make the practice cost-effective for the implementing individual or district. For example, incentives could be offered to encourage installation of on-farm measures to improve water quality, or for district level measures to vary the timing of diversions in ways that benefit fish species.

CALFED will take steps to further develop a proposed program to implement management improvements to achieve multiple objectives. These steps may include the following. First, similar programs will be identified and examined. If it appears appropriate, an advisory committee will be established to help define the most effective program. Once a program is better defined, CALFED agencies will assist with implementation, perhaps by developing a guidebook to help districts and interested parties identify opportunities. CALFED agencies may also provide planning or financial assistance to help districts use the guidebook and identify opportunities. Finally, CALFED will provide financial incentives to make identified opportunities cost-effective for local suppliers or users when these opportunities help meet CALFED objectives and priorities. Development of this program will require close coordination with other parts of the CALFED Bay-Delta Program including ecosystem quality, water quality, financing, and assurances.

5. Assurances for Agricultural Water Use Efficiency

Purpose: Provide assurance that agricultural water supplies are used at highly efficient levels.

The CALFED approach to agricultural water use efficiency is based on irrigation districts' cooperation with a voluntary program of planning, analysis, and implementation. While this approach is most desirable from the perspective of water users, it does not provide strong assurance that planning, analysis, and implementation of cost-effective measures will be pursued. Therefore, two categories of assurances are proposed: general assurances, and additional assurance mechanisms tailored to the proposed CALFED approach for agricultural water use efficiency.

The general mechanisms provide assurance that appropriate water management planning is carried out by local agencies and that cost-effective efficiency measures are implemented. Demonstration of appropriate planning and implementation will be necessary prerequisites for an agency to be eligible to receive any "new" water made available by a Bay-Delta solution, participate in a water transfer that requires approval by any CALFED agency or use of facilities operated by any CALFED agency, or receive water through the DWR Drought Water Bank (this is already a policy of DWR).

In addition to these general assurances, another mechanism (described below) is proposed to provide this assurance. This proposed agricultural assurance mechanism will be considered together with all other Program assurance needs in developing a final package of assurances.

If an acceptable majority of agricultural water suppliers have not prepared, adopted, received Council endorsement, and begun implementation of their agricultural water management plans

by January 1, 1999, then legislative and regulatory mechanisms will be triggered. An acceptable majority includes irrigation districts that serve water to at least two-thirds of the total acreage served by districts in the CALFED solution area, including the Imperial Valley. A period of two years from development of the CALFED water use efficiency approach was selected because it accommodates a two year planning cycle as described in the agricultural MOU, and it is short enough so that adequate assurances mechanisms can be put in place before Phase III of the CALFED Bay-Delta Program is initiated. Technical analysis to support the Council's decision of endorsement will be provided by DWR.

If a voluntary program of planning, analysis, and implementation does not meet the criteria described above, then CALFED agencies will work to establish legislative and regulatory policies for agricultural water users that are patterned after those that apply to urban water users. This includes an Agricultural Water Management Planning Act patterned closely after the existing Urban Water Management Planning Act and policies of CALFED agencies, as well as additional assurance mechanisms patterned after those that are applied to urban agencies as part of the Bay-Delta Program. These assurance mechanisms will need to be enacted before any CALFED Phase III water supply activities can begin. A proposed Agricultural Water Management Planning Act will be drafted in Spring 1997 to clarify this assurance mechanism.

V. URBAN WATER USE EFFICIENCY APPROACH

The urban areas of California currently use over seven million acre-feet of water each year. The majority of this demand is met by diverting water from the Bay-Delta system. As populations continue to grow, the demand will also grow. The CALFED Bay-Delta Program will help the urban sector meet its future water needs and improve supply reliability through a number of programs, one of which is to facilitate implementation of cost-effective water use efficiency measures.

Generally, over the past three decades, urban per capita water use has stabilized or even decreased in most areas of the State. The implementation of local water conservation programs, along with current housing development trends such as increased multiple-family dwellings and reduced lot sizes, have lowered per capita water use in many areas. However, even with current conservation programs, gross urban applied water demand is projected to grow. Part of this trend is due to increased urban growth in warmer inland areas where landscape irrigation needs are higher.

Developing new water supplies to meet increasing demands, treating this water to meet drinking water standards, and providing the infrastructure to deliver the water to customers is very expensive. In addition, most urban wastewater is typically released to salt sinks, such as the

Pacific Ocean or San Francisco Bay, where it cannot be recovered for other uses. The high costs associated with new supplies and the limited opportunities for reuse after discharge tend to make many urban water conservation measures cost-effective and attractive to urban water suppliers.

Many of the more recent locally implemented conservation efforts have resulted from over 150 urban water agencies signing the 1991 *Memorandum of Understanding Regarding Urban Water Conservation in California* (MOU) and beginning to implement BMPs as outlined in the MOU. Efforts to reduce urban demand are projected to continue, creating a potential for very significant water savings. However, the rate and extent of implementation by signatory agencies is currently far below the potential. In addition, many agencies have yet to sign the MOU or develop strong conservation programs. Higher levels of conservation need to be achieved as part of an overall CALFED solution.

Urban Water Conservation Actions

The urban approach recognizes a clear standard for implementation of cost-effective conservation measures and responsibility to carry out local water management planning. The approach establishes a process for recognition of adequate planning efforts and recommends a balanced process for recognition of adequate conservation implementation. The approach is supported by planning and technical assistance, financing assistance, and proposed assurances.

1. Conservation Implementation, Reporting, and Certification

Purpose: Provide a uniform, verifiable, locally-directed process for urban BMP implementation and reporting. Identify and implement opportunities for improved water use efficiency with a focus on water conservation.

The *Memorandum of Understanding Regarding Urban Water Conservation in California* (Urban MOU) provides a uniform, verifiable, locally directed process for implementation of cost-effective urban water conservation programs. All urban water suppliers should implement conservation programs that comply with the terms of the Urban MOU. This is consistent with public policy, state law, and public comments made during scoping for the CALFED Bay-Delta Program.

In contrast to the Agricultural MOU, the urban document does not provide a process for balanced review and endorsement of implementation efforts that meet the implementation levels and schedules of the MOU. CALFED recommends that the California Urban Water Conservation Council adopt a process for endorsement or certification of water supplier compliance with the terms of the Urban MOU. This would help CALFED agencies direct planning, technical, and

financing assistance toward local agencies that need this help, and would facilitate the implementation of appropriate assurance mechanisms.

2. Certification of Water Management Planning

Purpose: Help urban suppliers prepare, adopt, and implement useful water management plans and comply with the requirements of the Urban Water Management Planning Act (California Water Code 10610 et. seq.).

California State law recognizes the importance of good water management planning. The State's Urban Water Management Planning Act requires urban water suppliers to prepare and adopt Urban Water Management Plans and update them every 5 years. Provisions of the Act require agencies to:

- include information on an agency's past, current, and projected water supplies and demands,
- describe opportunities for exchanges or transfers,
- provide an analysis of demand management measures,
- provide a water shortage contingency analysis,
- describe the availability of, and potential for use of, recycled water, and
- assess the reliability of water service in all water year types.

Good-faith compliance with the Act helps agencies to improve water use efficiency, not only through analysis and implementation of BMPs but also through better analysis of water recycling, better long-term planning, and better drought contingency planning. Current efforts by some urban agencies to meet this planning requirement are adequate. However, of the nearly 400 agencies affected by the requirement, many currently fail to adequately address local water management issues and options or fail to produce any plan at all.

The Department of Water Resources currently assists urban water suppliers with the preparation and implementation of Urban Water Management Plans. This assistance will continue. Assistance programs will be expanded as necessary to ensure that lack of planning expertise does not impede preparation and implementation of effective Urban Water Management Plans.

In addition, DWR currently evaluates the Urban Water Management Plans submitted by the agencies. This evaluation process will be formalized to include a certification process for plans that comply with the terms of the Act. This will help DWR and other CALFED agencies direct planning, technical, and financing assistance toward local agencies that need this help, and will facilitate the implementation of appropriate assurance mechanisms.

3. Technical and Planning Assistance

Purpose: Ensure that lack of technical and planning expertise does not impede implementation of cost-effective measures by providing easily accessible assistance for planning and implementing local water management programs.

Technical and planning assistance is vital to the successful implementation of cost-effective conservation programs. Assistance can be directed either at *identification* of opportunities (water management planning, guidebook development, conservation program planning) or at *implementation* of opportunities (water audit training, mobile labs, technical review). Currently, both DWR and USBR provide this kind of assistance directly to their contractors as well as to other water suppliers. Under this action, both DWR and USBR will continue to provide technical and planning assistance. Assistance programs will be expanded as necessary to ensure that lack of technical and planning expertise does not impede implementation of cost-effective measures.

Additional assistance may be provided through local programs operated by Resource Conservation Districts, the California Urban Water Conservation Council, or water suppliers themselves.

4. Funding Assistance

Purpose: Ensure that lack of financing ability does not impede implementation of cost-effective measures. Provide easily accessible funding for planning and implementing water management programs.

Funding assistance is an integral part of the successful implementation of water management programs. CALFED will facilitate the implementation of local water management improvements by making available flexible funding assistance programs. Funding assistance for water suppliers and end-users, such as existing programs available through DWR, USBR, EPA and others, will continue under this action. Determination of most appropriate programs and levels of funding will be made in coordination with CALFED agencies, consistent with the principle that lack of financing ability should not impede implementation of cost-effective measures. Examples of funding programs include low interest loans, grants, direct financing, rebate programs, and bond pooling.

5. Assurances for Urban Water Management and Conservation

Purpose: Provide assurance that urban water suppliers will carry out good water management planning and implement cost-effective conservation programs.

Two categories of assurances are proposed: general assurances, and additional assurance mechanisms tailored to the proposed CALFED approach for urban water conservation.

The general mechanisms provide assurance that appropriate water management planning is carried out by local agencies and that cost-effective efficiency measures are implemented. Demonstration of appropriate planning and implementation will be necessary prerequisites for an agency to be eligible to receive any "new" water made available by a Bay-Delta solution, participate in a water transfer that requires approval by any CALFED agency or use of facilities operated by any CALFED agency, or receive water through the DWR Drought Water Bank (this is already a policy of DWR).

The Urban MOU provides a recognized standard for minimum implementation of cost-effective urban water conservation programs. CALFED recommends that the California Urban Water Conservation Council adopt a process for endorsement or certification of water supplier compliance with the terms of the Urban MOU. A process of certification coupled with sanctions for failure to comply with the terms of the Urban MOU will help assure that appropriate cost-effective measures are being implemented. This proposed assurance mechanism will be considered together with all other Program assurance needs in developing a final package of assurances.

The assurance mechanism described below identifies a central role for the Council. CALFED recognizes that such an approach will require the explicit approval of the full Council in order to succeed. Furthermore, CALFED understands that California Urban Water Agencies and the Environmental Water Caucus are currently working on development of a proposed urban water use efficiency approach that may include recommendations for certification and assurances. Such an approach, carrying the broad support that comes with development by stakeholders, may eventually influence the content of the CALFED adopted approach

The proposed assurance mechanism includes a graduated set of non-compliance sanctions directed at urban water suppliers including retail and wholesale agencies. Proper authority to implement sanctions will likely require legislation. Sanctions will include non-compliance fees combined with the possibility of a State Water Resources Control Board (SWRCB) investigation for waste and unreasonable use violations.

CALFED recommends that the Urban Council periodically review the status of BMP implementation for each urban water supplier, including MOU signatories and others, and bestow or withhold certification that a supplier is complying with the terms of the Urban MOU. Technical analysis to support the Council's decision of certification will be provided by DWR. Each time certification is withheld, the agency will be subject to the next level of sanctions. Initially, if an agency is not certified , the agency will be given a limited time extension for revising and completing a certifiable report. However, if the agency continues to be denied certification because of lack of implementation efforts, a first tier non-compliance fee will be levied. Upon a second failure to be certified, which could occur as early as the next reporting period, a second tier non-compliance fee will be levied. If an agency fails to be certified a third time, even if not during consecutive reporting periods, the Council will recommend that the SWRCB investigate the agency for possible waste and unreasonable use violations.

The SWRCB currently has the authority to investigate such violations. Because of a lack of the necessary resources, the SWRCB does not typically initiate investigations but rather responds to complaints of waste and unreasonable use that can be substantiated by the complainant. To alleviate this problem, non-compliance fees could be directly deposited in a fund to be used by SWRCB for employing staff to perform investigations requested by the Council. Alternatively, the Council could hold funds in an account and make an allocation to the SWRCB each time a violation is referred. This will help ensure that the SWRCB has ample resources to exercise its existing authorities.

VI. APPROACH TO EFFICIENT USE OF DIVERTED ENVIRONMENTAL WATER

In addition to the broad categories of urban and agricultural water needs, there are important environmental needs for adequate water supplies. These needs include appropriate instream flows, where water is the environment that supports aquatic species and processes, as well as needs for water diverted from the system to support a variety of public and private wetland areas such as national wildlife refuges and state wildlife areas. The CALFED Bay-Delta Program is examining both instream environmental water use and water diverted for environmental purposes. The instream environment is being addressed within the Program's ecosystem restoration program, while policies related to efficient use of environmental diversions are being examined in the context of the water use efficiency program.

There are many parallels between urban and agricultural water use, discussed above, and environmental water use on wetlands and refuges. First, the five general objectives for water use efficiency are applicable to environmental diversions. Second, there is a need to identify management practices that should be considered and analyzed by refuge managers. Finally, there

is a need for assurance that appropriate planning and implementation will take place so that environmental diversions are used efficiently, just as there is need for assurance of efficient use in the urban and agricultural sectors.

Three of the CALFED agencies (the California Department of Fish and Game, the U.S. Bureau of Reclamation, and the U.S. Fish and Wildlife Service) are working with the Grassland Resource Conservation District to develop an Interagency Coordinated Program for optimum water use planning for wetlands of the Central Valley. This program will include "Best Management Practices" for efficient water use and will develop a water use management planning process for refuge and wetland areas of the Valley. The program will include stakeholder and public involvement, and expects to have draft work products developed by October 1997.

The Interagency Coordinated Program is being developed under the auspices of the Central Valley Project Improvement Act. The Interagency Coordinated Program will work closely with, and coordinate with, CALFED to assure consistency of policy and solution principles, meet the general implementation objectives for water use efficiency, and propose mechanisms that assure the efficient use of water on refuges, wildlife areas, and managed wetlands.

Water management on wetlands is different in many ways from agricultural water management. Thorough analyses of both may lead to the identification of opportunities that will help meet various Bay-Delta Program objectives without impairment of the primary use of diverted water. For example, changes in the timing of drainage releases from either wetland areas or farms may improve instream flows at critical times or improve water quality. The Interagency Coordinated Program and CALFED Program development will be closely coordinated to identify actions that are similar between wetlands and agriculture, such as incentives for voluntary implementation of actions that meet the objectives and priorities of CALFED and CVPIA. .

VII. WATER RECYCLING APPROACH

[Note: This approach will be developed in coordination with appropriate CALFED agencies and consultation with stakeholders and the public, including the Water Use Efficiency Work Group.]

VIII. WATER TRANSFERS

[Note: This approach will be developed in coordination with appropriate CALFED agencies and consultation with stakeholders and the public, including the Water Use Efficiency Work Group.]

DRAFT

Storage and Conveyance Component Refinement

March 7, 1997

CALFED
BAY-DELTA
PROGRAM

PROGRESS REPORT
STORAGE AND CONVEYANCE
REFINEMENT PROCESS

BACKGROUND

Phase I of the CALFED Bay-Delta Program (Program) defines the program mission, objectives, and three general alternatives. The mission of the Program is to restore ecological health and improve water management for beneficial uses of the Bay-Delta system. The approach is to concurrently address problems in four resource areas:

- Water Supply Reliability (includes water use efficiency and water transfers)
- Water Quality
- Levee System Integrity, and
- Ecosystem Quality

The three alternatives developed in Phase I are differentiated by how they address the issues of Delta conveyance and type and amount of system storage.

The three concepts for Delta conveyance are:

- Alternative 1: More efficient use of the existing system of conveyance
- Alternative 2: Modified through-Delta conveyance
- Alternative 3: Dual conveyance using both through-Delta and isolated conveyance facilities

Each alternative includes varying configurations of system storage, including groundwater banking, in-lieu conjunctive use, and more surface storage capacity. These include storage upstream of the Delta on the tributaries of the San Joaquin River and Sacramento River systems, storage within the Delta itself, or storage connected to the SWP or CVP export aqueducts (historically referred to as south of Delta storage but for the purposes of this report referred to as aqueduct storage to differentiate it from storage on the San Joaquin River system).

CONSIDERATIONS FOR STORAGE AND CONVEYANCE DEVELOPMENT

The number of potential combinations of storage and conveyance facilities is too great to analyze each individually. Just as important, there is a wide range of operating rules for managing any new facilities. The challenge has been to find a reasonable number of configurations which can represent the range of options for evaluation at a programmatic level.

Phase II of CALFED Bay-Delta Program includes the following considerations that affect the storage and conveyance refinement process:

- **Component Refinement and Prefeasibility Analyses.** Sufficient analysis of conveyance concepts and potential storage sites must be completed to identify impractical and overly expensive options. In particular, over the long term, the alternative selection process must comply with Section 404(b)(1) of the Clean Water Act to the satisfaction of the Corps of Engineers and the EPA. This implies that in the short term, the storage and conveyance refinement process must comply with those requirements and that potential environmental impacts must be identified and given due consideration in the refinement and prefeasibility process.

- **Completion of the Programmatic EIR/EIS.** The EIR/EIS will include descriptions of potential impacts, define strategies for mitigation of those impacts, and document the selection of the preferred alternative. The alternatives will be defined in terms of general solution strategies and ranges of facility capacities. However, despite their programmatic nature, these ranges need to be founded on solid scientific and engineering information.

- **Collaborative Process.** CALFED agencies and stakeholders must have sufficient access to the process to be assured that the selected alternative is not only legally defensible, but generally meets the solution principles.

- **Focused Schedule.** All this work must move quickly, because the numerous technical, legal, biological, and institutional studies needed to complete the process become obsolete shortly after they are completed. Success can only be achieved by addressing all these challenges concurrently.

The remainder of this report summarizes the key elements of the refinement process and prefeasibility analysis which the Program designed to address the considerations and challenges outlined in the previous paragraphs.

SPECIFIC ELEMENTS OF THE PROCESS

Agency staff and stakeholders are involved in the process including model selection and selection of modeling assumptions.

Operating Concepts and Rules

Probably the most fundamental problem the Program faces is devising fair and reasonable operating concepts and rules for any new facilities. These rules will largely determine what resources will benefit from any new facilities, whether water supplies will be used to boost drought reliability or average annual water supplies. Concepts and rules for diversion or capture of flows for storage, as well as concepts and rules for release are intimately tied to Program visions for ecosystem restoration and Delta protective standards. The analysis process has been initiated by making some assumptions about concepts for diverting, releasing, and allocating water in the system. The key, though, is to fully explore the interactions of storage and conveyance components with the full range of CALFED goals. Input from the CALFED agencies and stakeholder community as to the appropriate range of operating concepts which will accomplish the goals is important to this process. The Program has been soliciting input on proposed operating concepts over the past six months and is incorporating them in the range of evaluations. These concepts will be refined into more specific operating rules as the process continues.

System Modeling

Any new facilities must fit into California's existing water management system. The Program can explore the effects of new facilities on water supplies, channel flows, reservoir elevations, by means of system modeling tools such as DWRSIM. This is a water accounting model, which estimates the storage and conveyance of water through the system, in accordance with all the concepts and rules devised to protect the Delta, instream flows, and water supplies. California's water management system is very complex, and so must be the model in order to be sufficiently realistic to be credible. As a result, it is a major effort to incorporate new facilities into the model in order to explore CALFED alternatives. Efforts to model the various potential CALFED storage and conveyance components using DWRSIM are underway.

Spreadsheet Post-Processing

Spreadsheet post-processing models are being used to do quicker evaluations to help guide the overall study effort. The spreadsheet models only work with unallocated water in the system. "Unallocated water" does not imply that the water is of no value to any of the beneficial uses including environmental; only that for a given month that there is more water in the system than is required to meet all existing mandated flow and water quality requirements plus water system operational needs. The spreadsheet models allow simulation of new facilities which can store and convey this water without really altering the operations of existing facilities. The Program has been using spreadsheets to evaluate the potential benefits both to the environment and to consumptive uses of adding surface storage components to the existing system under a variety of operating assumptions.

Delta Simulation Modeling

DWRSIM and the spreadsheet models can only estimate in the broadest terms what their effects on conditions in the Delta might be. Detailed Delta modeling is required to evaluate the effects of various proposed conveyance and storage facilities along with proposed operating rules will have on flows, stages, velocities, salinities, and particle transport in the Delta.

The Program has begun the Delta simulation process by picking some representative time periods, without assuming any new facilities outside the Delta. The various proposed Delta conveyance components can then be compared in terms of general effects on tidal amplitudes, flows, and velocities. Later, as the list of Delta conveyance options is narrowed, the Program will integrate the modeling with proposed new facilities upstream and downstream of the Delta.

While advancing modeling of Delta conveyance alternatives, CALFED's modeling staff have also been working to improve the modeling tools themselves. In the fall of last year the U.S. Bureau of Reclamation and the U.S. Geological Survey raised concerns about the accuracy of the current Delta simulation modeling tool used by CALFED, DSM1. New, high quality velocity data has become available over the past several years, which indicated that instantaneous velocities in some channels were much higher than predicted by the model. They expressed concern that this could seriously affect the credibility of the model, which could be a key tool in the eventual selection of a CALFED Delta conveyance alternative. In response, the Program assembled a team of modelers, who have since been working to recalibrate the model, using both new velocity and channel geometry data.

Facilities Inventory

While the modeling efforts can conceptually show how new storage and conveyance might affect stream flows, the Delta, and water supplies, there is a need to also look at specific locations and opportunities for constructing facilities. Every potential dam, pump station, canal, or pipeline has its own particular pros and cons, costs, and impacts. The first step in sorting through all these issues is to develop an inventory of potential storage and conveyance facilities throughout the CALFED problem and solution areas. The Program has developed such an inventory, with about 100 different surface storage, conveyance, and groundwater storage or in-lieu conjunctive use facilities. The draft inventory is available for review and comment.

Having assembled this inventory, the Program will use a reasonable and systematic way to identify those potential projects which might be impractical or have excessive environmental impacts. As indicated earlier, such a process must satisfy regulatory requirements as well as meet CALFED objectives and solution principles. The Program has begun discussions with Corps Regulatory staff regarding design of this process to meet 404(b)(1) requirements. This will require increasing levels of detail as the Program narrows the range of storage and conveyance options to a reasonable number for the EIR/EIS impact analysis.

Environmental Studies

A preliminary review of potential environmental impacts of facilities construction, at a programmatic level of detail, will help in narrowing the number of options for impact analysis. At this point the Program is not conducting field studies; there are simply too many potential locations to make this practical. The review includes aerial photographs, previous reports, the Department of Fish and Game's Natural Diversity Data Base, and other published information. As a general rule, the harder you look at any given area, the higher the likelihood of finding resources of special significance. This means that the Program has to be somewhat cautious in interpreting the information, because the level of detail varies greatly from location to location, depending on how much interest there has been in the past.

Engineering Studies

Consistent and reliable engineering information upon which the Program can compare costs and evaluate practicality will be developed during the prefeasibility analysis (see paper on Phase II Technical Evaluations). The facilities inventory developed preliminary costs by simply indexing costs from previous studies, some of which are recent, others which are decades old. Given the need to progress, the Program will develop new engineering and cost data for the remaining projects so that the results will be fully comparable. The Program has selected some representative projects which approximate the ranges of potential capacities to simplify prefeasibility engineering and cost analyses for use in the Programmatic EIR/EIS. The opportunity to add to this list of representative projects remains as the Program narrows the range for impact analysis and receives comments from agencies, BDAC, and other stakeholders.

Groundwater Banking and In-Lieu Conjunctive Use

The potential for CALFED involvement in groundwater banking and in-lieu conjunctive use creates concerns for counties and for the local water agencies where the programs would be implemented. Although direct construction impacts are generally less than for surface storage facilities, there is a potential for affecting domestic wells, farm operations, stream flow, habitat, towns and cities. In direct response to local concerns to this issue, the Program's first priority is to listen carefully to concerns and interests and look for opportunities where there is local interest, the potential to combine local and statewide benefits, and to develop pilot programs which demonstrate that assurances can be established. The assurances must protect local interests while promoting common benefits to counties and local water agencies, hand-in-hand with system water supply reliability benefits.

IDENTIFICATION OF COMPONENT LINKAGES

Linkages can be divided into two categories:

> Linkages which indicate adjustments in the four common programs to assure that all the proposed actions within each CALFED alternative are compatible. For example, the Delta conveyance component included within a particular alternative may offer specific opportunities for synergistic aquatic and terrestrial habitat enhancement.
>
> Potential site specific and flow related benefits associated with construction of new facilities or changing operations of existing facilities. The preliminary environmental evaluations of individual facilities represent an effort to address these linkages. Additional, more comprehensive evaluations will be conducted as part of the programmatic EIR/EIS.

INITIAL STORAGE AND CONVEYANCE COMPONENTS

The Program will not be selecting storage and conveyance facilities with specific locations or sizes during the programmatic EIR/EIS evaluation. Rather, results will be described in terms of general solution approaches, with a range of capacities. However, those general solutions must be founded on comprehensive engineering, modeling, environmental, and cost evaluations. Therefore, the Program has defined the general solution approaches and ranges of capacities in terms of the configurations of each of the alternatives, assembled from components which are likely compatible with each other. They are not final alternative configurations. Rather, several configurations are suggested for each of the three CALFED alternatives in order to evaluate a reasonable range of facilities, costs, and impacts in the EIR/EIS. Additional studies will define more specific configurations within this range. The alternative configurations are detailed in Chart 1-A and 1-B. From three to eight configurations are labelled alphabetically under each of the three CALFED alternative categories. ***When considering each of these configurations, please remember that each of these are combined with the ecosystem restoration program, the water quality program, the levee system integrity program, and the water use efficiency program.***

CHART 1-A
COMPONENT CONFIGURATIONS A-D

	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3
CONFIGURATION A	Re-Operation	North Delta Improvements 10,000 cfs Hood Intake South Delta Improvements	5,000 cfs Open Channel IF North Delta Improvements South Delta Improvements
CONFIGURATION B	Re-Operation CVP-SWP Improvements	North Delta Improvements 10,000 cfs Hood Intake South Delta Improvements CVP-SWP Improvements 3.0 MAF Upstream Sto. (Sac River Tribs.) 2.0 MAF Aqueduct Sto. 200 TAF In-Delta Sto. 500 TAF Groundwater Sto. (Sac Valley) 500 TAF Groundwater Sto. (San Joaquin Valley)	5,000 cfs Open Channel IF North Delta Improvements South Delta Improvements CVP-SWP Improvements 3.0 MAF Upstream Sto. (Sac River Tribs.) 500 TAF Upstream Sto. (San Joaquin Tribs.) 2.0 MAF Aqueduct Sto. 200 TAF In-Delta Sto. 500 TAF Groundwater Sto. (Sac Valley) 500 TAF Groundwater Sto. (San Joaquin Valley)
CONFIGURATION C	Re-Operation South Delta Improvements CVP-SWP Improvements 3.0 MAF Upstream Sto. (Sac River Tribs.) 1.0 MAF Aqueduct Sto. 500 TAF Groundwater Sto. (Sac Valley) 500 TAF Groundwater Sto. (San Joaquin Valley)	Western 15,000 cfs Isolated South Delta Intake Northern 15,000 cfs Isolated South Delta Intake Eastern 15,000 cfs Isolated South Delta Intake CVP-SWP Improvements	5,000 cfs Pipe IF North Delta Improvements South Delta Improvements
CONFIGURATION D	N/A	10,000 cfs Hood Intake Mokelumne River Floodway (East) East Delta Habitat South Delta Habitat CVP-SWP Improvements 2.0 MAF Aqueduct Sto.	5,000 cfs Pipe IF North Delta Improvements South Delta Improvements CVP-SWP Improvements 3.0 MAF Upstream Sto. (Sac River Tribs.) 2.0 MAF Aqueduct Sto. 200 TAF In-Delta Sto. 500 TAF Upstream Sto. (San Joaquin Tribs.) 500 TAF Groundwater Sto. (Sac Valley) 500 TAF Groundwater Sto. (San Joaquin Valley)

CHART 1-B
COMPONENT CONFIGURATIONS E-H

	ALT. 1	ALTERNATIVE 2	ALTERNATIVE 3
CONFIGURATION E	N/A	Tyler Island Habitat Mokelumne River Floodway (West) East Delta Habitat South Delta Habitat CVP-SWP Improvements 3.0 MAF Upstream Sto. (Sac River Tribs.) 500 TAF Upstream Sto. (San Joaquin Tribs.) 2.0 MAF Aqueduct Sto. 500 TAF Groundwater Sto. (Sac Valley) 500 TAF Groundwater Sto. (San Joaquin Valley)	15,000 cfs Open Channel IF North Delta Improvements CVP-SWP Improvements 3.0 MAF Upstream Sto. (Sac River Tribs.) 500 TAF Upstream Sto. (San Joaquin Tribs.) 2.0 MAF Aqueduct Sto. 200 TAF In-Delta Sto. 500 TAF Groundwater Sto. (Sac Valley) 500 TAF Groundwater Sto. (San Joaquin Valley)
CONFIGURATION F	N/A	N/A	Chain of Lakes North Delta Improvements CVP-SWP Improvements 3.0 MAF Upstream Sto. (Sac River Tribs.) 500 TAF Upstream Sto. (San Joaquin Tribs.) 2.0 MAF Aqueduct Sto. 500 TAF Groundwater Sto. (Sac Valley) 500 TAF Groundwater Sto. (San Joaquin Valley)
CONFIGURATION G	N/A	N/A	5,000 cfs Screened Deep Water Ship Channel and West Delta Tunnel North Delta Improvements CVP-SWP Improvements 3.0 MAF Upstream Sto. (Sac River Tribs.) 500 TAF Upstream Sto. (San Joaquin Tribs.) 2.0 MAF Aqueduct Sto. 200 TAF In-Delta Sto. 500 TAF Groundwater Sto. (Sac Valley) 500 TAF Groundwater Sto. (San Joaquin Valley)
CONFIGURATION H	N/A	N/A	5,000 cfs Open Channel IF Tyler Island Habitat East Delta Habitat South Delta Habitat CVP-SWP Improvements 3.0 MAF Upstream Sto. (Sac River Tribs.) 500 TAF Upstream Sto. (San Joaquin Tribs.) 2.0 MAF Aqueduct Sto. 500 TAF Groundwater Sto. (Sac Valley) 500 TAF Groundwater Sto. (San Joaquin Valley)

PHASE II
TECHNICAL EVALUATIONS

IMPACT ANALYSES

The primary technical evaluations during Phase II of the CALFED Bay-Delta Program will be the **impact analyses** for the programmatic EIR/EIS. The impact analyses will examine the differences between the alternatives (including the existing condition and the no-action alternative) at the program level of detail and present the information for decisions on a broad range of alternatives. The impact analyses will provide understanding on how the storage and conveyance components interact with the other components that make up the alternatives, including ecosystem restoration, water quality, levee system integrity, and water use efficiency.

The main purpose of the impact analyses is to compare and contrast the alternatives rather than to optimize sizes, select specific configurations, or select specific sites for any actions within the alternatives. In many cases, the impact analysis will simply provide descriptions of how conditions would be different between the existing condition, the no-action, and the programmatic alternatives. The impact analyses are scheduled for completion by fall 1997.

PREFEASIBILITY STUDIES

The Program will also conduct **prefeasibility studies** for the storage and conveyance, water quality, and ecosystem restoration components; studies for storage and conveyance are underway. These studies will provide more detailed information than that obtained from the impact analyses for the programmatic EIR/EIS. The Program has chosen to conduct impact analyses and prefeasibility studies at the same time rather than conducting them sequentially. However, the prefeasibility studies will continue after the impact analyses are completed. The following paragraphs show some advantages of proceeding now with prefeasibility studies:

> **Provide Support for Impact Analyses** - The prefeasibility studies provide the foundation for the programmatic impact analysis by developing specific information on costs, water supply, flows, water quality, site impacts, and other factors for representative combinations of components. For example, the feasibility of implementing offstream storage to enhance water supply opportunities depends on the specific locations available for development such as topography, geology, environmental concern, proximity to a water supply source, and existing conveyance facilities. By exploring some representative combinations of facilities in terms of specific costs, benefits, and impacts, the prefeasibility evaluations will provide a solid foundation for the programmatic evaluations. These studies help determine the ranges for impact analyses.

Refine Layouts, Sizes, and Other Details - While the impact analyses will evaluate a broad range of facility sizes, the prefeasibility studies provide information for additional sizes within that range. For example, if the range of north of Delta storage is 200 thousand acre-feet to 1 million acre-feet for an alternative, then the impact analysis will examine benefits and adverse impacts for the low and high end of the range, and perhaps an additional anlaysis at the mid-range. The prefeasibility analyses will provide additional detail that may lead to narrowing the range of sizes for the preferred alternative (for example, down to the 500 to 600 thousand acre-feet range).

When alternatives are weighed against program goals and objectives as well as solution principles in selection of a preferred alternative, this higher level of information on all the components, but especially the storage and conveyance components, can assist the stakeholders and decision makers. This additional level of decision support information is the focus of the prefeasibility analysis.

Provide Detailed Costs Not Required for the EIR/EIS - The programmatic EIR/EIS will primarily display benefits and adverse impacts of the alternatives and will include only program level costs for the ends of the range being studied. The prefeasibility studies will provide more detailed cost information to assist the stakeholders and decision makers in their deliberations on the "preferred alternative".

Shorten Time to Implementation - The prefeasibility studies provide early direction for the process of planning, site specific environmental documentation, design, and construction required for project implementation in Phase III. While the studies will not progress so far, before the seletion of the preferred alternative, so as to produce unnecessary analysis, starting the prefeasibility studies before completion of the EIR/EIS will allow the Program to move more efficiently into project implementation.

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