CALFED Water Management Strategy -- Summary

November 12, 1998

The CALFED Water Management Strategy addresses the question: "How does CALFED propose to manage or affect the (1) diversion, (2) storage, (3) transportation, (4) transfer, and (5) application/use of water in order to meet its ecosystem, water supply, and water quality objectives?"

The Bay-Delta problems result from the interaction between physical, biological and economic factors. Central Valley of California is a flat, but is surrounded by high mountains. Winter storms bring rain and snow to the mountains. Rainfall runs immediately into the Central Valley, then through the Delta into San Francisco Bay. High winter flows bring flooding. Snow melts and runs out in the spring. Interannual variability in runoff is high. Droughts are relatively common.

Physical realities are not well aligned with economic needs. North of the Delta, runoff exceeds economic needs; south of the Delta, economic needs exceed runoff. Very high winter pulse flows are at odds with channelization of the rivers to maximize agricultural acreage. Economic needs for water peak in the summer; natural runoff peaks in the winter and is low during the summer. Economic needs for water are relatively constant across years; but supplies are highly variable.

California's water system was built to align physical realities with economic needs. Reservoirs are only partially filled in winter to buffer large runoff pulses during the winter. Then, reservoirs capture spring runoff for release during the summer. Extra storage is used to capture water in wet years for use in dry years. Water is diverted from the Delta for use on the west side of the San Joaquin Valley and in southern California, effectively using northern surpluses to supply southern shortfalls.

In turn, historical land and water development to maximize economic output created biological problems. Causality is not always clear. However, a combination of: (1) habitat conversion for agriculture; (2) blockage of spawning runs by dams; (3) channelization of rivers and depletion of gravel and sediment sources; (4) changed flow patterns, particularly in dry years; (5) diversion impacts; (6) toxics; and (7) exotic invasions are responsible for major declines in the populations of native fish, including salmon, Delta smelt, and steelhead.

Biological problems induced various responses. These responses have improved flows and reduced diversions -- harming water users -- but have yet to restore fish populations. The following responses result from the biological damage caused by land and water development: (1) Existing and proposed ESA listings for all runs of salmon, Delta smelt, and longfin smelt; (2) the CVPIA; (3) FERC proceedings; (4) new SWRCB standards; (5) litigation over releases from Friant Dam; and (6) Increased Trinity River flows. These responses have or will reduce the amount of water available for economic purposes. (See the attached table, "Water Supply Impacts of Protective Operating Criteria.") Fish populations have improved of

late, but have yet to reach levels considered acceptable.

Attempts to improve the quality of drinking water are complicated by the location of the export pumps. The export pumps, which supply at least part of the water for nearly 20 million people are at the bottom of the Central Valley watershed and within a few miles of San Francisco Bay. The water pumped from this location contains toxics and organic carbon from upstream, and salts from downstream. As drinking water quality standards have become more stringent, the cost and complexity of water treatment has increased.

The CALFED Bay-Delta Program was created (among other things) to a resolve or ameliorate the biological, water supply, and water quality problems associated with the Delta. CALFED's solution to these problems will involve many different kinds of actions, including habitat restoration, source control of toxics, changes in water use efficiency and changes in water infrastructure and operations. The water management strategy is limited to defining the appropriate infrastructure for and operation of (1) diversions, (2) storage, (3) conveyance, (4) transfer, and (5) application/use of water to solve these problems.

CALFED's Water Management Strategy is based upon solving a number of water management objectives. There is considerable overlap between these objectives:

- **Reduce Diversion Conflicts.** That is, decouple economic health from environmental harm, and environmental health from economic harm.
- **Increase Supply Predictability.** Increase the reliability of intra year supply projections. For example, export constraints based upon the take of fish reduce the predictability of supplies.
- **Increase Supply Utility (Water Quality).** Increase the value/acre-foot of water to users. For example, saltier water is of less utility to water users.
- **Decrease Drought Impacts.** Reduce overall environmental and water user shortages or reduce the overall environmental and economic impacts of shortages.
- **Increase Supply Availability.** Provide means for water users or the environment to acquire additional water at high priority times and places.
- **Increase Operational Flexibility.** Improve the ability of the water system to respond to unpredictable future realities -- e.g., changes in weather patterns, changes in biological needs -- without major economic impacts.

Many water management tools are available to help solve these problems, including:

- **Water Use Efficiency**
- **Recycling**
- **Increased Storage Capacity**
- **Increased Conveyance Capacity to Storage**
- **Increased Flood Flow Capacity**
- **Watershed Management**
- **Monitoring and Real-Time Operations**
- **Operational Changes for Water Quality**

- **Diversion Relocation**
- **Diversion Technology**
- **Changes in Local Operations**
- **Various Types of Water Markets**

CALFED's solution principles and financial principles help define what solutions are acceptable. There are many technically feasible ways to meet CALFED's water management objectives. Solutions based almost exclusively upon recycling, storage, markets or other individual tools are technically (and in some cases economically) feasible. However, application of CALFED's solution and financial principles directs CALFED to focus on solutions which integrate all the tools together. The CALFED solution principles state that the CALFED solution must, in addition to technical effectiveness, meet the following criteria:

- **Equity**
- **Durability**
- **Affordability**
- **Implementability**
- **Reduce Conflicts**
- **No Significant Redirected Impacts**

Moreover, the financial principles state that beneficiaries of the CALFED solution must pay their fair share of the costs.

Considering the magnitude of conflicts over available water in California, CALFED believes that it must aggressively evaluate and implement all available water management options to ensure water supply reliability. Therefore, aggressive implementation of water conservation, recycling, and a protective water transfer market are critically important for effective water management. New surface and groundwater storage will be constructed as necessary, considering appropriate implementation of nonstructural programs and demonstrated willingness to pay by potential beneficiaries, to meet CALFED's program goals. During Stage 1, CALFED will evaluate and determine the appropriate mix of these water management tools.