RECOMMENDATIONS OF CALIFORNIA URBAN WATER AGENCIES
STAGE 1 WATER QUALITY ACTIONS

The California Urban Water Agencies (CUWA) recommends that CALFED include the following high priority water quality actions and research activities in Stage 1 of the CALFED Bay-Delta Program.

ACTIONS AND PILOT STUDIES

Immediate (Years 1-2)

Watershed Wide Actions

1. Drinking Water Protection Strategy - Develop and implement a strategy in coordination with the State Water Resources Control Board, Regional Water Quality Control Board, Environmental Protection Agency, and Department of Health Services to economically address impacts on water quality (in particular, salinity, TOC, and pathogens) from increased municipal waste discharges and urban runoff to the Delta and its tributaries.

2. Coordinate with other CALFED common programs to ensure that in-Delta modifications for ecosystem restoration and levee stability maximize the potential for improvements in Delta water quality.

Delta Actions

1. Pilot Study on Agricultural Drainage Control Actions - Conduct a comprehensive pilot study of potential methods of reducing organic carbon loadings to the central Delta from agricultural drains. The goal is to identify and evaluate actions to reduce drainage quantity and/or improve drainage quality discharged to the central Delta that are economically feasible and result in improved water quality at the south Delta pumping plants. Potential actions to be investigated in the pilot study include:

- Pilot studies on feasibility of removing TOC in agricultural drainage. Initial focus should be on Twitchell Island and central Delta islands. Investigate various treatment technologies at pilot scale in field experiments.

- Relocation of agricultural drains to discharge locations that are remote from the pumping plants. Investigate economic feasibility of a central Delta drain that would discharge to the Sacramento River.

- Store summer drainage and, where feasible, winter drainage on individual islands in the central Delta and release downstream of urban intakes on the ebb tide.

- Pilot active land management projects including conversion to early season crops, no tillage farming practices, reduced frequency of winter leaching, conversion to wetlands, land retirement, and less water intensive irrigation systems.

2. Feasibility Study on Rock Slough Drains - Investigate the feasibility of managing or relocating agricultural drains discharging to Rock Slough and the unlined portion of the Contra Costa Canal

3. Implement Barker Slough Watershed Management Plan - The Plan is being developed with funding from Proposition 204 and the North Bay Aqueduct Contractors. Additional funds are needed to implement the plan.

San Joaquin Actions

1. Encourage Source Reduction Programs -Tiered pricing, expansion of drainage recirculation systems, land management, and land retirement where other options are infeasible.

2. On-farm Water Conservation - Expand existing program and increase funding to encourage on-farm water conservation practices to reduce subsurface drainage discharge volumes without adversely impacting control of root zone salinity.

3. Expand San Joaquin River Real-Time Monitoring Program - Include Grassland Drainage Area. Time drainage and wetland discharges with periods with considerable assimilative capacity for dissolved solids in the river. Existing total load limits for the Grassland Bypass Channel must not be exceeded.

4. Agroforestry Pilot Studies - Expand and fund projects on agroforestry to use drainage water to irrigate salt tolerant crops and trees.

5. Selenium Removal/Reduction Pilot Studies - Conduct pilot studies on selenium reduction and removal processes.

Near-term (Years 3-7)

Delta Actions

1. Implement Agricultural Drainage Control Actions - Implement cost effective recommendations from the pilot study of Central Delta drainage. Expand studies to full or demonstration scale where additional data are needed. Begin implementation of some actions proven feasible in the pilot studies.

2. Implement Rock Slough Drainage Actions - Implement cost effective recommendations from CCWD study.

3. South Bay Aqueduct Watershed Management Plan - Develop and implement a watershed management plan for the South Bay Aqueduct.

San Joaquin Actions

1. Treatment Pilot Studies - Conduct pilot studies on treating drainage water to remove salinity and continue investigation of market potential for salt.

2. Land Management - Purchase agricultural lands and manage for water quality.

RESEARCH

Immediate (Years 1-2)

1. Impacts of Ecosystem Restoration Projects - Evaluate impacts of ecosystem restoration projects on organic carbon and other drinking water parameters so that drinking water quality is not compromised by ecosystem projects.

2. Sources of Organic Carbon and Dissolved Solids - Conduct a study of sources of TOC and TDS in the Delta and the Sacramento and San Joaquin watersheds and evaluate BMPs to address identified high loading sources. As part of this study obtain actual Delta agricultural drainage volume data.

3. Sources of Pathogens - Develop work plan for a study on sources of pathogens in the Delta and the Sacramento and San Joaquin watersheds. Include evaluation of methods for accurately detecting pathogens in source waters.

4. Sources of Bromide - Conduct research on sources of bromide in the San Joaquin River and relative contribution to south Delta concentrations.

5. Bromide Panel Recommendations - In coordination with the Environmental Protection Agency and the Department of Health Services follow-up on recommendations of the CALFED Bromide Panel for health effects studies.

6. Treatment Pilot Studies - Develop work plans for pilot studies on treating drainage water to remove salinity and investigate market potential for salt.

Near-term (Years 3-7)

1. Pathogen Sources - Conduct study of sources of pathogens in Delta and tributaries and evaluate BMPs.

POTENTIAL LONG-TERM ACTIONS

Long-term actions depend upon the evaluations conducted in the first seven years of the program and some will depend upon decisions that are made on storage and conveyance alternatives. Potential long-term actions include the following:

Delta Actions

1. Collect and Store all Drainage - On individual islands in central and south Delta and release on ebb tide.

2. Central Delta Drain - Collect drainage from Central Delta islands and discharge to Sacramento River.

3. Treatment - Collect drainage from central and south Delta islands and treat for TOC removal. Discharge concentrated residual drainage at a location that would not affect beneficial uses.

4. Land Management - Purchase agricultural land in the Delta and manage for water quality.

San Joaquin Actions

1. Agroforestry Programs - Implement agroforestry projects to reduce drainage volume.

2. Treatment of Drainage Water - Treat agricultural drainage to remove salt and selenium. Dispose of residual salts in an environmentally sound manner.

3. Develop Market For Residual Salt that is created by other actions.

4. Land Management - Retire and/or manage lands to improve water quality. Land should be managed by resource agencies or the water district.

Treatment Actions

1. Bromide Removal - Treat Delta water to remove bromide.

2. Membrane Treatment - Where feasible, use membrane technology to remove pathogenic microorganisms to reduce need for high disinfectant doses.

Facilities

1. Relocate Diversion Point -To reduce seawater influence on drinking water supplies.

2. Storage - Use storage to capture higher quality water for later use for blending to meet water quality goals.

Overall Priority B - Long-term (LT) measures not yet implemented, with potential for significant water quality improvements, with information collection priorities that could be advanced through CALFED.

Note: A ranking of 3 is indicative of the highest likelihood of occurrence or the least amount of effort required. A ranking of 1 is indicative of the lowest likelihood of occurrence or the most amount of effort required. Rankings for the Cost Effective and Low Cost categories (**bold**) are given, but are very speculative. The scores for each category are summed to obtain the Overall Priority ranking. A higher total indicates higher priority. If it is desired to give a higher priority to solution approaches requiring a larger amount of additional information, the score of the Availability of Information category must be adjusted accordingly.

Table 2- Priority Ranking for Salinity Solution Approaches

Solution Approach	Significant Improve. in WQ	Highly Probable Success	Cost Effective	Low Cost	Cost Sharing	Availability of info.	Overall Priority
Source Control	2 ST/LT	3	**3**	**2**	3	3	16
Timed Release	3 ST/LT	3	**3**	**3**	3	3	18
Drainage Reuse	3 ST	3	**3**	**2**	2	2	15
Reverse Osmosis	3 LT	3	**1**	**1**	3	2	13
Cogeneration	2 LT	2	**1**	**1**	3	2	11
Recirculation	2 LT	2	**2**	**2**	3	1	12
Agrofor./ Salt Sep.	3 LT	2	**2**	**2**	3	2	14
Out-of-Valley	3 LT	2	**1**	**1**	2	1	10

Short-term (ST) measures already being implemented or tested mostly without CALFED assistance.

Long-term (LT) measures not yet implemented, with potential for significant water quality improvements, with information collection priorities that could be advanced through CALFED.

Note: A ranking of 3 is indicative of the highest likelihood of occurrence or the least amount of effort required. A ranking of 1 is indicative of the lowest likelihood of occurrence or the most amount of effort required. Rankings for the Cost Effective and Low Cost categories (**bold**) are given, but are very speculative. The scores for each category are summed to obtain the Overall Priority ranking. A higher total indicates higher priority. If it is desired to give a higher priority to solution approaches requiring a larger amount of additional information, the score of the Availability of Information category must be adjusted accordingly.