

California Bay-Delta Program

Drinking Water Quality Program Multi-Year Program Plan (Years 5 – 8)

Implementing Agencies:

State Water Resources Control Board

Regional Water Quality Control Boards

United States Environmental Protection Agency

State Department of Health Services

January 2004



Goals, Objectives and Targets

Goals and Objectives:

The Drinking Water Quality Program (DWQP) goal is to advance efforts to provide safe, reliable, and affordable drinking water to the millions of Californians who rely on waters from the Delta watershed through cost-effective continuous improvement to source water quality, water management, and treatment. To reach this goal, DWQP actions combine cost-effective improvements in source water quality, advancements in treatment technology, and innovations in water management.

Work has progressed on all of the Record of Decision commitments with emphasis on source water improvement and treatment technologies. The Drinking Water Subcommittee (DWS) of the Bay-Delta Public Advisory Committee has developed a framework for drinking water quality management stemming from discussion of the ROD water quality targets. This framework is captured in the “Equivalent Level of Public Health Protection Decision Tree” (ELPH diagram) named for the language in the ROD (see detailed Program Plan, attached). The ELPH diagram shows the broad range of actions and factors that can affect drinking water quality.

Following the ELPH diagram, the water quality improvement accomplishments and activities of the program are grouped into five categories:

- **Delta Water Quality** – actions to improve the quality of the water that reaches the export pumps including Source Improvement, Conveyance, Delta Operations, and Storage
- **Imported Water Quality** - includes CVP/SWP Operations and Storage south of Delta and Source Water Exchanges outside of the Delta
- **Local Source Water Quality** – actions to improve the quality of local sources that are used in conjunction with Delta water
- **Treatment Options** – includes actions to advance the use of innovative water treatment methods both at drinking water treatment plants and at pollutant sources
- **Program Management** - includes Monitoring, Assessment, Implementation Commitments, Subcommittee support, and other actions necessary for program implementation

Targets:

The ROD contained little that could be interpreted as “targets” for the Drinking Water Quality Program. There is the general objective to continuously improve Delta water quality for all beneficial uses and the more specific targets for the disinfection byproduct precursors bromide and organic carbon. Actions, a few specific projects, milestones, and projected program expenditures were also presented but there are no unqualified numeric targets similar to those for other program elements. The disinfection byproduct precursors target in the ROD, “to achieve either: (a) average concentrations at Clifton Court Forebay and other southern and central Delta drinking water intakes of 50 ug/L bromide and 3.0 mg/L total organic carbon, or (b) an equivalent level of public health protection using a cost effective combination of alternative source waters, source control and treatment technologies”, has proven difficult to interpret and apply. The numeric target for bromide is clearly not achievable using the Delta as a source of drinking water which leads to interpretation of the second part of the objective. The challenges of part (b) are many. There has been no consensus on the amount of “public health protection” represented by the numeric targets or how to measure the benefits of program actions in terms of public health protection. Because of these problems with the current targets, the DWQP and the Drinking Water Subcommittee have initiated an effort to clarify and refine targets as part of the effort to develop a strategic plan for the DWQP.

The strategic planning process was started in October of 2003 and is scheduled for completion by July 2004. The plan is being developed by a DWQP workgroup consisting of implementing agency staff, CBDA staff, DWS representatives, and stakeholders. Facilitated meetings are held monthly with results and deliverables presented to the full DWS at each monthly Subcommittee meeting. The strategic plan is intended to guide program implementation for the next ten years. It will consolidate the information in several planning documents previously developed for the program and may include new actions developed during the strategic planning process. It will include recommendations for processes to measure success including revised targets, performance measures, and reporting.

Accomplishments

Delta Water Quality

North Bay Aqueduct Alternative Intake Study: Evaluation of intake relocation completed in 2003 (2001 DWQP grant).

North Bay Aqueduct Watershed Management: A watershed management evaluation of Barker Slough has been completed. Recommended Best Management Practices (BMPs) are being implemented and results monitored. (Prop 204 and DWQP)

Best Management Practices for Agriculture: __ Projects have been awarded to develop and implement agricultural Best Management Practices (BMPs) that reduce loads of drinking water constituents of concern. (DWQP and Prop 13)

CVRWQCB Basin Plan Amendment (salinity and boron): The draft BPA and TMDL have been circulated for public review. Two workshops were held in 2003.

DWR Agricultural Drainage Program (salinity and selenium): Includes management and coordination, monitoring and evaluation, on-farm drainage reduction, treatment, integrated drainage management and environmental investigations.

Real Time Monitoring and Management of Salinity: The Regional Board, DWR, and Lawrence Berkeley National Laboratory in cooperation with the USGS and local water districts, implemented a real-time monitoring and modeling program for salinity in the San Joaquin River. Flow and salinity were monitored, and salt load and salt assimilative capacity were modeled, for three years through December 2002 (DWQP, DWR, Prop 204).

Rock Slough and Old River Water Quality: Contra Costa Water District has completed feasibility studies and has initiated environmental documentation. Recommended projects have been awarded and will begin in 2004. (DWR, Prop 13)

Alternate intake for the North Bay Aqueduct: The alternative intakes study has been completed. SCWA will present the results to the California Department of Health Services, Department of Water Resources and California Bay-Delta Authority (CBDA) to determine the next steps. At these future next steps SCWA will include additional public involvement and potentially start the CEQA process.

Imported Water Quality

Sanitary Surveys: DWR completed the sanitary survey of the State Water Projects and its tributaries. DWR also monitors run-off into the California Aqueduct and the South Bay Aqueduct.

Bay Area Water Quality and Supply Reliability Program: This program is evaluating cooperative projects among Bay Area water districts to meet their water supply reliability and drinking water quality objectives. Phase 1 evaluated overall Bay Area water quality, developed a list of potential projects and provided a qualitative evaluation of the ability of existing infrastructure to provide sufficient high quality water to meet the drinking water objectives in the ROD.

State Water Project Watershed Actions: __ projects to perform watershed assessments and implement watershed improvement actions have been awarded in watersheds draining into the California Aqueduct, other SWP conveyances and SWP reservoirs downstream of the Delta (DWQP, Watershed Program, Prop 13).

San Joaquin Valley / Southern California Water Quality Exchanges: Metropolitan Water District (MWD) has entered into two partnerships with San Joaquin Valley water agencies to explore water management opportunities to help resolve water supply and water quality management problems.

Operational Improvements/ Recirculation in the San Joaquin River: US Bureau of Reclamation and DWR have completed the modeling studies, which are undergoing management review. The reports will then be forwarded to the fisheries agencies for a preliminary fish and wildlife evaluation.

Local Source Water Quality

Irvine Desalter – Irvine Ranch Water District will build a groundwater desalination plant to make use of a local aquifer with naturally high salinity. Water produced will be higher in quality than imported blend of Delta and Colorado River water and will improve quality of the aquifer. This project was selected for funding by the DWQP in the 2003 SWRCB Consolidated RFP.

Dominguez Gap Wetlands Multiuse Project – Los Angeles County Flood Control District will construct treatment and habitat wetlands to improve the quality groundwater recharge from the Dominguez Gap spreading grounds. This project was selected for funding by the DWQP in the 2003 SWRCB Consolidated RFP.

Treatment Options

Ultraviolet (UV) Light Disinfection: Metropolitan Water District is conducting studies integrating UV disinfection and other oxidants (DWQP). A consortium of Bay Area water agencies lead by Contra Costa Water District is beginning a program investigating combinations of advanced treatment technologies applied to Delta Water. The primary objective is to aid utilities using Delta water in developing compliance strategies through modification of existing facilities, and installation of new treatment processes (EPA and AWWARF).

Ion Exchange for Organic Carbon Removal: The DWQP awarded a grant to Solano County Water Agency to investigate application of innovative ion exchange technology for organic carbon removal. Bench scale studies are under way to be followed by a pilot scale system.

Regional Desalination: Agricultural drainage water recycling using membrane technology by Panoche Drainage District started in Year 4. (DWQP, ERP, Prop 204)

Desalination Research and Innovation Partnership (DRIP): A MWD project intended to demonstrate innovative desalination technologies to treat a variety of brackish and high salinity wastewaters. The program has already resulted in the development of advanced reverse osmosis (RO) membranes.

Program Management

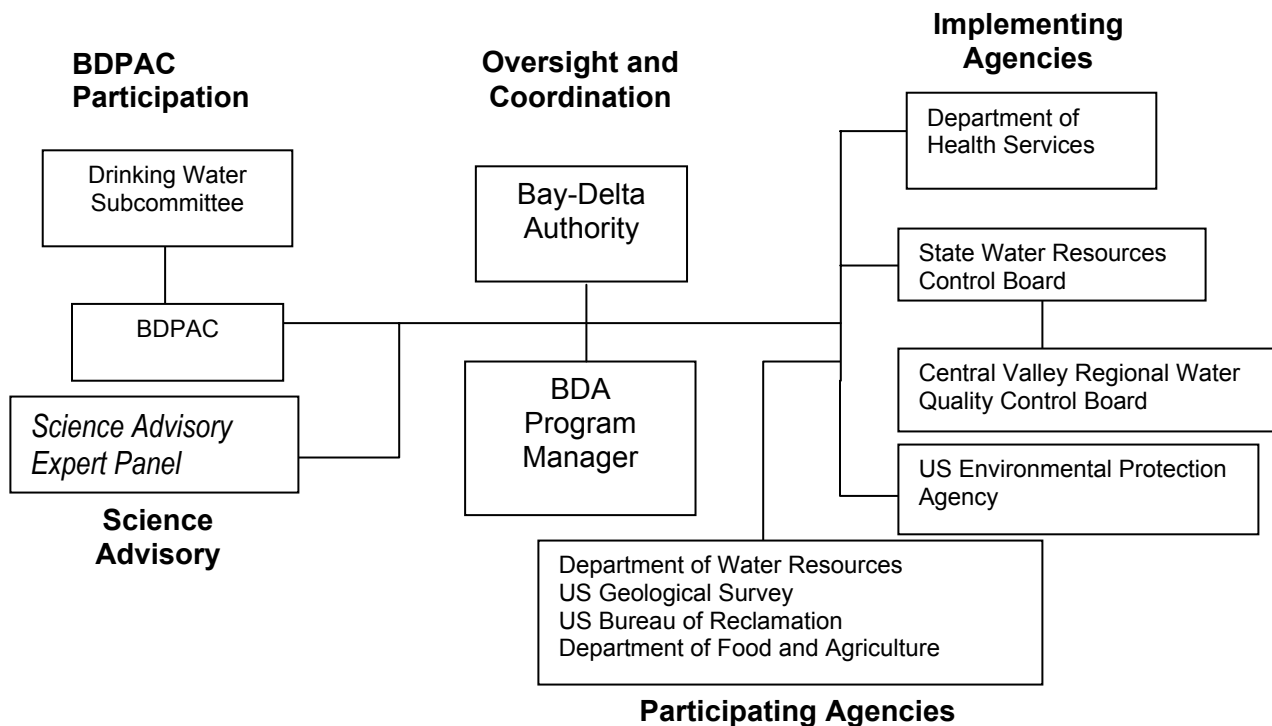
Monitoring and Assessment: The DWQP is working with existing monitoring programs and supporting complimentary efforts. 15 monitoring and assessment projects have been awarded for \$8 million. New projects initiated in FY 03/04 include an award to Santa Clara Valley Water District to purchase and install continuous real-time bromide and nutrient monitoring devices at Banks Pumping Plant and Vernalis (DWQP, DWR) .

2001 CALFED Drinking Water Quality Program Grants: The DWQP awarded grants for 13 projects totaling \$6.7 million. Emphasis in this first PSP was on monitoring and assessment.

2002 SWRCB RFP: The SWRCB with the DWQP taking the lead on the selection process awarded grants for 13 projects totaling \$7.2 million in Prop 13 nonpoint source funds. Seven of these projects are related to agriculture in the San Joaquin Valley.

2003 SWRCB Grants – Release of \$31.5 million for drinking water quality source improvement projects, including development and assessment of best management practices for discharges from Delta islands, irrigated agricultural and urban sources.

Program Structure



Agency	Roles and Responsibilities
California Bay-Delta Authority	<ul style="list-style-type: none"> Oversight and coordination
Department of Health Services	<ul style="list-style-type: none"> State co-lead Management of treatment technology development, and health effects studies Grant funds manager
State Water Resources Control Board	<ul style="list-style-type: none"> State co-lead, Grant funds manager
Central Valley Regional Water Quality Control Board	<ul style="list-style-type: none"> Management of source protection efforts
U.S. Environmental Protection Agency	<ul style="list-style-type: none"> Federal lead Administration of Clean Water Act and Safe Drinking Water Act via state agencies
Department of Water Resources	<ul style="list-style-type: none"> Municipal water quality investigations SWP water quality monitoring Conveyance program
U.S. Bureau of Reclamation	<ul style="list-style-type: none"> San Joaquin Valley agriculture drainage program CVP water quality monitoring, Recirculation study
Department of Food and Agriculture	<ul style="list-style-type: none"> Conservation programs for agriculture
U.S. Geological Survey	<ul style="list-style-type: none"> Data and science assessments of water quality Contract research

Major Activities

Delta Water Quality

Coordinate with Conveyance Projects – The DWQP will continue to coordinate with conveyance projects in order to fully understand water quality benefits and cost-effectiveness of potential actions including the South Delta Program, Through-Delta Facility/Delta Cross Channel Operations, and flooded island studies.

Schedule: Ongoing

Coordinate with Storage Projects – The DWQP will continue to coordinate with storage projects in order to fully understand water quality benefits and cost-effectiveness of potential Storage actions including North of Delta Off-Stream Storage, Los Vaqueros Reservoir Expansion, and In-Delta Storage.

Schedule: Ongoing

Support Regional Planning – As part of the strategic planning process, the DWQP and DWS will develop regional conceptual models in order to assist local water supply agencies with acquiring the information they need to make cost effective investments in improved water quality.

Schedule: Ongoing

Sacramento River Watershed Program – US EPA will be providing an additional \$500,000 in federal funds to continue the program.

Schedule: Continue 2005

Drinking Water Policy for the Delta and its Tributaries – Years 4-7 will be devoted to implementation of the policy work plan. The final product of the working group will be a comprehensive policy proposal that will be provided to the Regional Board for their regulatory adoption (likely in the form of a Basin Plan Amendment).

Schedule: Completion 2009

DWR Agricultural Drainage Program (salinity and selenium): DWR will continue its drainage program including management and coordination, monitoring and evaluation, on-farm drainage reduction, treatment, integrated drainage management and environmental investigations. DWR will also manage Proposition 204 Drainage Reuse Sub-account projects.

Schedule: Ongoing

North Bay Aqueduct Livestock Fencing Within Watershed: Continuation of work previously implemented in watershed. This project can be completed within one year of authorization to proceed. The SCWA is committed to ongoing monitoring, at the SCWA's cost after completion of the grant.

Schedule: To Be Determined

Best Management Practices (BMPs) for Nonpoint Sources – This includes projects to identify and implement management practices to reduce loads of drinking water pollutants of concern to the Delta and its tributaries. These projects are primarily funded through implementing agency grant solicitations. Efforts will focus on the major types of nonpoint sources in the Delta watershed including irrigated agriculture, managed wetlands, livestock grazing, and urban runoff.

Schedule: Ongoing

Delta Improvements Package - The drinking water quality elements of the Delta Improvements Package are also listed individually in this program plan. They include: the Rock Slough and Old River projects, lower San Joaquin River salinity TMDL, San Joaquin Valley drainage programs, Frank's Tract project, and Delta conveyance projects.

Imported Water Quality

State Water Project Watershed Sanitary Survey – Future work includes an update report for 2006, as well as the development of modeling tools to track sources and loads of contaminants in the project.

Schedule: Completion 2007

Bay Area Water Quality and Supply Reliability Program – Phase 2 include completion of the analysis and evaluation of those results to identify alternatives or portfolios that group a variety of alternatives together that meet the objectives of the various Bay Area agencies. As Phase 2 nears completion, the Bay Area water districts involved in the project will need to work closely with other Bay Area stakeholders and STATE AND FEDERAL agencies to determine how to proceed with Phase 3, environmental review, feasibility, and design.

Schedule: Completion Spring 2004

San Joaquin Valley / Southern California Water Quality Exchanges – Both the Friant and Kings Partnerships are moving towards investigating specific projects that will facilitate water quality exchanges. In December 2003, Friant and Metropolitan Water District (MWD) approved a Phase 2 Workplan. Soon, MWD will be amending the existing Kings Workplan to address funding specific projects.

Schedule: Completion 2007

Operational Improvements/ Recirculation in the San Joaquin River – Contingent upon funding being identified, USBR will conduct sediment sampling, economic analysis, legal analysis, additional fisheries study, public involvement, and final documentation.

Schedule: Completion 2007

Structural Changes to the California Aqueduct- To be updated

Treatment Options

UV Light Disinfection (CCWD Project) –

Schedule: To Be Determined

Agricultural Drainage Water Recycling Using Membrane Technology – Panoche Drainage District (supported by a CALFED grant) will implement this project to investigate application of membranes to remove salts, selenium, and nutrients.

Schedule: Completion 2007

Local Source Water Quality

Regional Planning and Actions – The DWQP through its implementing agencies will support regional and local drinking water quality planning efforts. Actions to improve local source water quality will be supported through competitive grant programs managed by the implementing and participating agencies including DHS, SWRCB, EPA, and DWR.

Schedule: Ongoing

Program Management

Monitoring and Assessment – CALFED Monitoring and Assessment Program (MAP): There are three primary goals for the MAP. 1) Develop a trends monitoring program that will indicate if drinking water quality is changing over time and identify where changes are taking place. 2) Develop a program of studies, conceptual models, numerical models, workshops, and reports that will answer questions about sources, fate, transport, and management of contaminants of concern. 3) Improve access to information related to drinking water quality in the California Bay-Delta Program solution area.

Schedule: Ongoing

2003 SWRCB Grants – \$31.5 million is available for grants in the current RFP which was initiated in Year 3 but will be completed in year 4. The remaining funds will be distributed as grants in years 4-7.

Source Improvement projects will continue to be a high priority for the DWQP in Years 4-7. Nearly all of the projects funded by the DWQP in Years 1-3 are in progress and will be completed in Years 4-7. Projects will be assessed for progress towards programmatic goals. Funding available for full implementation of source improvement projects anticipated in years 4-7 is \$12.7 million from Prop 13 and up to \$91.5 million from Prop 50, Chapter 5. Additional grant funding is possible from other Prop 50 chapters for source improvement projects.

2004 DHS Prop 50 Grants – To be updated

Schedule

To be updated.

Integrating Science, Environmental Justice and Tribal Relations

Science:

There are several key objectives that will depend heavily on the availability of reliable scientific information about the Bay-Delta system. There are a number of critical unknowns for the program including:

1. The TOC and bromide targets in the ROD are intended to protect public health by reducing disinfection byproduct formation. Are TOC and bromide the most appropriate measures of disinfection byproduct formation potential?
2. How can source control, water management, and treatment be used most effectively in to reduce risk from disinfection byproducts, pathogens, and other pollutants of concern?
3. What are the long-term trends in ambient concentrations and loads of the drinking water program pollutants of concern (organic carbon, bromide, pathogens, turbidity, salinity, and nutrients)?
4. How will large scale and long term changes to the system affect source water quality? For example: How will increasing population and urbanization of the Central Valley impact source water quality?

The DWQP will work with the Science Program to address these and other management questions. The program will seek to answer these through the appropriate use of scientific experts, directed studies, grants, workshops, and peer review.

Performance Measurement – The program is committed to gathering information about water quality and other measures of program success. This is one of the primary objectives of the monitoring and assessment program. The program has a list of candidate indicators, has established indicators for TOC and bromide in exported water, and plans to develop more indicators as resources and data allow.

Environmental Justice:

To be updated

Tribal Relations:

Tribal relations have been less critical for the drinking water quality program than for program elements with major construction projects. Projects funded through the implementing agency grant programs are required to identify potential tribal issues and address them in their projects. The DWQP participates in tribal workshops to help identify drinking water quality issues of concern to tribes.

Cross-Program Relationships

Conveyance Program – DWQP has contributed resources to the modeling of how water moves through the Delta operations of the Delta Cross Channel to move high quality Sacramento River water to central Delta channels and the export pumps and studies of the proposed screened diversion on the Sacramento upstream of the Delta Cross Channel

Ecosystem Restoration Program – ERP and DWQP water quality problems are frequently associated with the same sources indicating the need for cooperative monitoring and source improvement strategies.

Watershed Management – The Watershed Program and DWQP work cooperatively on grant funding processes and have overlapping program objectives. Building local capacity for watershed management activities provides the mechanism for identifying, guiding, and implementing drinking water quality improvement projects. The Watershed and Drinking Water Quality Programs, working with the SWRCB, have coordinated their grant funding processes.

Water Use Efficiency – An important element of both the WUE and DWQP is promotion of good water measurement and management by agricultural users. Water Use Efficiency is identified as an important element in the ELPH diagram.

Levee System Integrity Program – The Delta levee system provides important protection against salinity intrusion, therefore, the DWQP recognizes the significant influence the progress and success that the LSIP will have on protecting the quality of Delta water supplies.

Storage Program – DWQP is coordinating with the Storage Program since storage projects can have positive or negative effects on Delta Water Quality. The construction of the major dams of both the State and federal water projects greatly reduced seasonal fluctuations in Delta salinity. Additional storage north of the Delta is likewise expected to have water quality benefits. On the other hand, feasibility studies of the proposed in-Delta storage project show that it could increase loadings of some pollutants.

Stage 1 Funding

Drinking Water Quality (\$ in millions)	Program Year								Stage 1 Subtotal	8	Total
	1	2	3	4	5	6	7				
State											
Federal											
Local/Water User											
Actual & Expected Funding											
Estimate of Full Funding Needs											
Original ROD											

Stage 1 Funding by Task

Drinking Water Quality (\$ in millions)	Program Year								Total	
	1	2	3	4	5	6	7	Stage 1 Subtotal		8
Actual and Expected Funding										
Estimate of Full Funding Needs										
Original ROD										

Geographical Distribution of Activities

To be updated.