

**Summary of Discussion from 6/23 Meeting  
on CALFED Water Quality Program Programmatic Actions**

Group focussed on crafting broad problem statements to identify primary water quality problems and provide a framework for assortment of water quality actions. The group was working from a 5/13/97 draft of Appendix B - Water Quality Programmatic Actions. Generally, the group did not focus on specific methods identified in the actions.

Group decided:

- to integrate discussion on different sources for same constituent (e.g. selenium issue should integrate discussion on different sources such as refineries, agriculture, etc.);
  - to make problem statements as broad as possible, so as to not limit the range of possible actions or solutions;
  - to link "performance measures" to quantifiable, legally promulgated standards (where feasible), that may be attained in the shorter-term and can also be adjusted/revised as additional information becomes available;
- and to focus "indicators of success" on statements regarding biological conditions or ecosystem effects that are desired as longer-term outcomes;
- not to perform a broader prioritization of the various problems and actions, but did indicate where they felt that a particular problem may not be a "high priority" or widespread in nature;
  - to identify where water quality problems or actions are linked to ecosystem restoration objectives, and, in particular, where there may be a conflict between ecosystem restoration objectives and improving water quality;
  - to highlight where there is a need for further study to better define a problem, understand fate and transport mechanisms, etc.

ACTION 1 - MINE DRAINAGE - CU, CD, ZN (Charlie, Chris, Sam)

**Problem Statement:** Reduce toxic effects of metals on aquatic organisms. Problem is manifested in at least three areas: (1) Runoff in Upper Sacramento River Basin. Sediment toxicity in Keswick Reservoir; bioaccumulation of metals in Upper Basin. (2) Copper in the lower Sacramento River basin resulting from agricultural applications of copper-based pesticides. (3) Chronic effects and bioaccumulation in lower trophic organisms in Suisun Bay. Potential resuspension from sediments. Generally, data does not indicate metal problems in water column in Delta. Monitoring will need to factor in the temporal nature of the problem.

{Linked to ecosystem restoration}

**Sources:**

Rice fields -Address high copper in runoff from rice fields in May/June to protect fish in the lower Sacramento River.

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OPTIONAL FORM 99 (7-90)

**FAX TRANSMITTAL**

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NSN 7540-01-317-7368 5099 .101 GENERAL SERVICES ADMINISTRATION

Mines - (Action 1) Control runoff and flushing during the wet season from mines in the upper reaches of the Sacramento River. In particular, flushes from the first storms contain high levels of copper, cadmium and zinc. Need to determine what impact the treatment plant installed at the Iron Mountain Mine site has had on metals discharges.

Urban & Industrial Runoff - (Action 3)

Wastewater & Industrial Discharges - (Action 8)

**Performance Measures:** Achievement of Basin Plan objectives for cadmium, copper and zinc in the Sacramento River above Hamilton City. (Loads is not a useful measure, due to the unknown link between loading and toxicity.)

**Indicators of Success:** Decreased toxicity and decreased bioaccumulation of metals; decreased concentrations in organisms.

ACTION 2 - MINE DRAINAGE - Hg

(Charlie, Chris, Sam)

**Problem Statement:** High mercury levels in sport and recreational fish has left certain fish inedible --> Reduce mercury levels in fish in order to eliminate fish advisories.

{Linked to ecosystem restoration}

**Sources:**

Mines - Old mercury mines in Sierra  
Hydraulic mining debris  
Cache Creek watershed  
Mt. Diablo mine

Sediment in estuary - methylation of mercury within marshes

Need to determine contributions of natural background levels versus anthropogenic sources. Need also to assess local bioavailability of mercury. Need to better define cycling of mercury throughout the ecosystem.

**Performance Measures:** Link to improved understanding of mercury methylation processes

**Indicators of Success:**

ACTION 4 - PESTICIDES (CHLORPYRIFOS AND DIAZINON) - URBAN & INDUSTRIAL RUNOFF (Chris, Sam)

**Problem Statement:** (A) Reduce acute toxicity of water from organic compounds (from known sources) in order to protect aquatic organisms. (B) Define and address chronic toxicity of Central Valley waters - determine sources, impacts, cumulative impacts from mixture of contaminants (e.g. pesticides and metals), etc.

{Linked to ecosystem restoration}

**Sources:**

(A) - acute toxicity - pulse inputs of diazinon and chlorpyrifos -

urban & industrial runoff (Action 4)  
agricultural sources (Action 12)

**Performance Measures:** DFG Criteria

**Indicators of Success:**

**ACTION 5 - OXYGEN DEPLETION, NUTRIENT LOADINGS - URBAN & INDUSTRIAL RUNOFF** (*Chris*)

**Problem Statement:** Improve passage of adult salmon around Stockton turning basin during the fall. (Salmon migration is prevented by oxygen sags during specific times of year.) This problem appears to be fairly localized, as well as occurring during specific times of year.

{Linked to ecosystem restoration}

**Sources:**

Urban runoff - first flush in Stockton area (Action 5); need to determine if this is a more general or widespread problem.

Treatment plant discharge during low flow conditions in fall - Rough & Ready Island (Action 8)

**Performance Measures:** Achievement of Basin Plan objectives for dissolved oxygen in the Delta and its tributaries, particularly in the lower San Joaquin River.

**Indicators of Success:** Improved passage of adult salmon.

**ACTION 6 - SEDIMENT LOADING, TURBIDITY - URBAN & INDUSTRIAL RUNOFF** (*Bruce H, Bruce M.*)

**Problem Statement:** Reduce impacts of sedimentation and subsequent turbidity to both (1) the ecosystem in Delta tributaries and (2) municipal and industrial water supplies. (1) Sediments generated by human activities can adversely impact spawning grounds for anadromous fish; in particular, fine sediments can cause siltation of spawning grounds in the Upper Sacramento River basin. (2) Sediment-generating activities can also adversely affect turbidity levels at the water supply intakes in the Delta, particularly in the vicinity of the North Bay Aqueduct.

{Linked to ecosystem restoration}

**Sources:**

Urban development - Redding area, (Action 6)

Agriculture & Timber activities - (need new Action)

**Performance Measures:** (2) Decreased turbidity levels at North Bay Aqueduct - achievement of 50 NTU at North Bay Aqueduct.

**Indicators of Success:** (1) quality of spawning gravels in Delta tributaries

**ACTION 7 - PATHOGENS FROM BOATER DISCHARGES**

**Problem Statement:** Pathogens resulting from boat discharges in the Delta can impact recreational water

users, as well as drinking water supplies. Determine if human health problem due to harvest and consumption of shellfish in Delta (e.g. corbicula).

**Sources:**

Boat discharges (Action 7)

**Performance Measures:**

**Indicators of Success:**

**ACTION 9 - SELENIUM, INDUSTRIAL DISCHARGES**

(Sam, Les)

**Problem Statement:** Reduce selenium toxicity to higher trophic levels. Selenium poses a threat to sturgeon, halibut and diving ducks. Need to determine relative contributions of different sources, pathways, and overall fate and transport mechanisms for selenium in the estuary.

{Linked to ecosystem restoration}

**Sources:**

Refineries - (Action 9)

Agriculture - (Action 10)

Stormwater runoff from upper watershed (new action?)

**Performance Measures:** Basin Plan standards

**Indicators of Success:** Selenium levels in sturgeon tissue and food sources (e.g. potamocorbula); lifting of bird advisories in Suisun Bay (?)

**ACTION 11 - SALINITY, AGRICULTURE**

Need to bring in agricultural expertise;

**Problem Statement:**

**Sources:**

**Performance Measures:**

**Indicators of Success:**

**ACTION 13 - AMMONIA, AGRICULTURE**

(Chris)

**Problem Statement:** Doesn't appear that ammonia is causing toxicity problems, some specific areas where there is excessive ammonia, not sure this is a high priority

**Sources:**

Dairies (Action 13)

Agricultural Drains (Action 13)

Wastewater Treatment Plants - Merced, Woodland (Action 14)

**Performance Measures:**

**Indicators of Success:**

## ACTION 15 - WATER TREATMENT

*(Bruce M.)*

**Problem Statement:** Drinking water quality can be affected by (1) presence of pathogens, and (2) byproducts resulting from the treatment of source water to address Total Organic Carbons (TOCs) and bromides. The goal is to improve the quality of drinking water served from the Delta through both source reduction of contaminants and improved treatment.

**Sources/Methods:**

Source reduction - Pathogens, TOCs, Turbidity, Bromides (Assortment of Actions)  
Treatment techniques (Action 15)

**Performance Measures:****Indicators of Success:**

## ACTION 16 - TOXICITY

*(Sam, Chris, Charlie)*

**Problem Statement:** Toxicity tests suggest that chemicals/toxicity are affecting species of concern in the estuary. Need to develop a toxicity testing program as a high priority component of the comprehensive monitoring program. Also need to determine impacts of toxicity within ecosystem.

{Linked to ecosystem restoration}

**Sources:** (Linked to Actions 1, 2, 3, 4, 8, 12.)

**Performance Measures:****Indicators of Success:**