

# MEETING SUMMARY

## CALFED Water Quality Technical Group

May 20, 1998

Board Room, Board of Equalization  
450 N Street, Room 121, Sacramento

### **Water Quality Technical Group:**

Ted Roefs, Bill Crooks, Dave Forkel, Manucher Alemi, Russ Grimess, John Turner, Jerry Troyan, Elaine Archibald, Charlie Kratzer, Tom Maurer, K.T. Shum, Victor Pacheco, Leo Winternitz, Lori Clamurro, Roberta Borgonovo, Kevin Donhoff, Lynda Smith, John Winther, Marguerite Young, Wayne Verrill, Kati Buehler, Rich Breuer, Rosemary Clark, Stella Siepman, Steve Herrera, Chris Foe, Tom Grovhoug J.P. Cativiela, Mark Stephenson, Stephen Murrill,

**CALFED Team:** Rick Woodard, Steve Shaffer (DFA), Gail Louis (EPA), Bruce Macler (EPA), and Paul Gilbert-Snyder (DHS).

**Welcome and introductions** - Rick Woodard opened the meeting with introductions and review of the agenda. Rick provided a brief update on the status of convening an expert panel to provide CALFED with input regarding potential human health and cost consequences of selecting a Preferred Alternative, with respect to bromide in drinking water supplies taken from the Delta. To date, eighteen names have been suggested as candidates for the expert panel. Given CALFED's time frame for selecting a preferred alternative by the end of the year, the panel's activities will be initiated ASAP. Rick solicited input regarding the tasks to be performed (or questions that should be addressed) by the panel by the end of the week.

**Comprehensive Monitoring, Research and Assessment Program (CMARP)** - Leo Winternitz, DWR and CALFED staff, gave a presentation on CALFED's activities to develop a Comprehensive Monitoring, Research and Assessment Program (CMARP) for the entire program. The CALFED Policy Group directed \$1.8 million toward the effort by USGS, San Francisco Estuary Institute (SFEI) and Interagency Ecological Program (IEP) to develop an umbrella research and monitoring program. Leo requested that the CALFED water quality working groups provide to him input on: (1) specific water quality research and monitoring needs, and (2) what research questions or monitoring objectives will these activities address?

In response to a query, Leo indicated that the folks working on the CMARP effort have initiated discussions with contacts at the Sacramento River Watershed Program. Leo also mentioned that SFEI is developing an inventory of existing monitoring and research activities in the estuary that will identify data, objectives, frequency of collection and use. Someone from the audience mentioned that DWR will be releasing soon a compendium of water quality monitoring; this compendium is being incorporated into SFEI's inventory. Steve Shaffer, CDFA and CALFED staff, requested that Leo and other CMARP staff help solidify the link between working group

activities and CALFED. Steve also suggested that Department of Pesticide Registration monitoring activities be integrated into CMARP efforts.

**Proposal Solicitation Package (PSP)** - Cindy Darling, CALFED staff, provided a summary on the May 1998 Proposal Solicitation Package (PSP). The PSP focuses on 9 specific topics: fish passage assessment, fish passage and related screen improvements, flood plain management and habitat restoration, sediment management, fish harvest management tools, species life history studies, local watershed stewardship, environmental education, and small screen evaluations and alternatives. A maximum of \$24,550,000 will be awarded through this solicitation. Proposals must be submitted by July 2, 1998. On June 2, 1998, CALFED is holding a pre-submittal workshop to answer questions on the PSP. Information on previously funded Category 3 projects is available through CALFED's website. Cindy distributed a handout titled "Status of Water Quality Actions" summarizing topics and anticipated funding levels for a future funding proposal to be released this fall. Scoping for this fall solicitation on certain water quality topics is being conducted by the IEP Contaminant Effects Project Work Team. In response to a question from the audience as to how the early Ecosystem Restoration program is addressing impact on water quality, Cindy indicated that each funded Category 3 project will go through the NEPA/CEQA processes, as appropriate, and will also include a monitoring component.

**Work Group Updates** - Bruce Macler then gave an overview of the process to refine the actions of CALFED's water quality program. At the April meeting, the Water Quality Technical Group participants broke into 5 working groups

- **Metals Group** - copper, cadmium, zinc, and mercury.
- **Pesticide Group** - Diazinon, chlorpyrifos, carbofuran, DDT, Chlordane, Toxaphene and PCBs.
- **Agricultural Water Group** - Salinity and selenium
- **Nutrients/sediments Group** - turbidity, sediment, and nutrients
- **Drinking Water Group** - TOC, bromides, pathogens, and salinity

These groups have been meeting in person or by conference call to develop more detailed action programs. The purpose of today's WQTG meeting is to present the first iteration of these action statements, particularly focussing on problem statements. The WQTG will meet again in late July to review the more detailed statements, which will include a feasibility analysis of the different methods or approaches. After Bruce's introduction, a representative from each of the five workgroups presented a status report on the group's activities.

## Activities Summary, May 1998

### CALFED Metals Working Group Report

Participants: Charlie Alpers (USGS), Robert Brodberg (OEHHA), Peter Dileanis (USGS), Joe Domagalski (USGS), Chris Foe (CVRWQCB), Tom Garcia (Sacramento County), G. Fred Lee (G. Fred Lee & Associates), Gail Louis (EPA/CALFED), Paul Marshall (CALFED), Linda Mercurio (Mining Remedial Service), Mark Stephenson (DFG), John Turner (DFG),

The group is working on the following 3 actions from the CALFED Water Quality Program Plan:

- 1) Mine Drainage, Action 1 - Reduce the impairment to environmental beneficial uses within the Delta and Sacramento River regions associated with cadmium, copper, and zinc loadings by source control or treatment of mine drainage at inactive and abandoned mine sites.
- 2) Mine Drainage, Action 2 - Reduce the impairment of environmental and recreational beneficial uses within the Delta, Sacramento and San Joaquin River regions associated with mercury loadings by source control and/or treatment of mine drainage at inactive and abandoned mine sites.
- 3) Urban & Industrial Runoff, Action 1- Reduce the impairment of environmental beneficial uses in the Delta, Sacramento and San Joaquin River regions associated with copper, zinc and cadmium from urban and industrial runoff.

Items 1 and 3 above have been combined into one action statement addressing copper, cadmium and zinc.

### **Copper, Cadmium & Zinc Action**

The work, to date, has focussed primarily on defining the extent of the problem. There are data indicating elevated water column concentrations and acute aquatic toxicity in the Upper Sacramento; there are limited or no data, however, on sediment and fish tissue concentrations. There are also limited data regarding extent of the problem in the Delta. The San Francisco Regional Monitoring Program has observed toxicity at the confluence of the Sacramento and San Joaquin Rivers; metals have recently been identified as a principle component of this toxicity.

Sources include acid mine drainage, urban and industrial runoff, and point source discharges.

### **Mercury Action**

Problem Statement: Mercury has been found throughout the San Francisco Bay-Delta estuary at elevated concentrations in water, sediment and organisms. Mercury is of concern from both an environmental and human health perspective. In general, mercury accumulates up aquatic food chains so that organisms in higher trophic levels have higher mercury concentrations. High mercury levels in sport and recreational fish have culminated in consumption advisories in which some consumers are advised to not eat these fish. Mercury (in the form of methyl mercury) poses a serious concern to human health as it accumulates in tissue, bioaccumulates within the food web, and is a potent neurotoxin in humans.

Sources:

- Abandoned mines in the Coast Range
- Hydraulic mining debris from Sierra gold mining activities
- Recycling from sediment deposits
- Atmospheric transport
- Industrial processes

**Approaches:** Since it is well-documented that mercury is an important contaminant in the San Francisco Bay Estuary and can affect humans and wildlife, it is appropriate that a coordinated and well-planned effort be implemented to determine cost-effective solutions or remediation of the problem(s). A broad rationalization for this approach is to conduct a thorough risk appraisal for the Bay-Delta and tributaries, including the major rivers and their tributaries, and to determine the extent of the problem or risks to humans and wildlife. Following that, an exposure assessment should be conducted to determine the major sources and transport, and transformations of biologically available mercury and, in parallel, a risk management strategy should be formulated for remediation, and public awareness/education.

**Phase I - Risk appraisal and & advisory**

- Source, transport, mine site inventory, and geological site inventory
- Transformation and bioavailability studies
- Information management
- Public outreach

**Phase II - Fish tissue monitoring**

- Implement remedial activities
- Refine/verify models
- Ongoing information management & outreach activities

**Phase III - Continue fish tissue monitoring**

- Monitor loads and forms of mercury in water & sediment
- Evaluate success of remedial activities
- Ongoing information management and outreach activities

The group has produced an 18-page writeup that is currently being reviewed by both workgroup members and the Cache Creek Watershed Group.

### **Salinity and Selenium Team Report**

**Membership:**

- Manucher Alemi, DWR
- Vashek Cervinka, DWR
- Kevin Donhoff, MWDCS
- Russ Grimes, USBR
- Les Grober, CVRWQCB
- Alex Hildebrand, SDWA
- Bill Johnston, MID
- Gail Louis, US EPA

- Don Marciochi, DWD,
- Tom Maurer, USFWS
- Joe McGahan, GAF
- Eugenia McNaughton, US EPA
- Nigel Quinn, LBL
- Steve Shaffer, CDFA
- K.T. Shum, CCWD
- Lenore Thomas, USBR
- Wayne Verrill, DWR/SJVDIP

- Action A**      **Salinity from agriculture**
- Action B**      **Salinity from non-agricultural sources**
- Action C**      **Selenium from agriculture**
- Action D**      **Selenium from industry**

**Action E**      **Water management for salinity**  
**Action F**      **Flow and circulation for salinity**

**Action Item A - Salinity from agriculture (Les Grober)**

Reduce Impairment of Environmental, Agricultural, Municipal, and Industrial Beneficial Uses in Delta Region Associated with Salinity Through Source Control and Treatment of Agricultural Surface and Subsurface Drainage in the Sacramento and San Joaquin Rivers

*PROBLEM STATEMENT...*

Surface and subsurface agricultural drainage are the major source of salt in the lower San Joaquin River Basin. Agricultural Drainage is also a source of salt in the Sacramento River. Salt loading leads to impairment of water quality in the lower SJR and Delta Region.

*SOLUTION APPROACHES...*

1.      Improve Supply Water (E1)<sup>1</sup>
2.      Source Control / Drainage Reduction
3.      Re-use
4.      Agroforestry
5.      Reverse Osmosis
6.      Cogeneration
7.      Real-time Management (E4)
8.      Out of Valley Drain

**Action Item B - Salinity from non-agricultural sources (Les Grober)**

Evaluate Loading of Salt from Non-agricultural Sources in the Delta and the Sacramento and San Joaquin Rivers and Assess the Need for Source Control Measures to Reduce Impairment of Environmental, Agricultural, Municipal, and Industrial Beneficial Uses.

*PROBLEM STATEMENT...*

Water supply in the Delta and its tributaries may have locally and seasonally elevated salt concentrations in excess of established water quality objectives to protect beneficial uses. Fish and wildlife may also be adversely impacted by elevated salinity and may be even more sensitive (toxicity) to specific ions. Salt loading from non-agricultural sources (including wastewater and industrial discharges, urban runoff, wetland discharges) must be quantified by type and region.

*SOLUTION APPROACHES...*

1.      Quantify salt load of non-agricultural sources by type
2.      Quantify salt loads by region
3.      Identify location and magnitude of beneficial use impairment
4.      Identify data gaps
5.      Identify specific approaches to reduce loading for each type and area of discharge

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<sup>1</sup>Solution approach will be discussed in detail under the indicated item;  
e.g. (E1) Solution Approach 1 in Action Item E

**Action Item C - Selenium from agriculture (Joseph McGahan)**  
(Calfed WQP - Agricultural Drainage and Runoff - Action Item 1, page 20)

**Title:**

Reduce impairment of environmental beneficial uses of water in the Lower San Joaquin River and the Delta associated with selenium loadings by controlling sources of selenium in agricultural subsurface drainage water.

**Problem Statement:**

Agricultural drainage water from the Grasslands area is a major source of selenium to the San Joaquin River and the Delta. Selenium is a trace element of concern. Selenium has been measured in fish and invertebrates. Selenium concentrations are high in drainage water, but are generally below water quality objectives at Vernallis.

**Approaches to Solution**

1. Treatment of Drainage
2. Removal of Selenium from soil/water
3. Selenium Marketing
4. Drainage reduction (A2)
5. Reused of Drain water
6. Agroforestry/Salt Separation (E2)
7. Active Land Management
8. Land retirement
9. Timing of release
10. Out of valley disposal
11. Upper watershed management.

**Action Item D - Selenium from industry (Tom Maurer)**

**Wastewater And Industrial Discharge:**

Reduce The Impairment Of Environmental Beneficial Uses In The Delta Region Associated With Selenium Loadings Through Source Control And Treatment Of Industrial Discharges To The Suisun Bay And Carquinez Strait.

**Problem Statement**

Oil refineries are a significant source of selenium to the Bay/Delta area. Elevated concentrations of selenium have been measured in mussels, waterfowl, and fish leading to health advisories although concentrations in water are below criteria. Concentrations in mussels have risen in the past 8-10 years. Selenium concentrations in eggs from white sturgeon are at levels known to cause reproductive failure in other fish species. Mercury has been found to increase the bioaccumulation potential of selenium adding additional cause for concern in the Bay/Delta area.

## **Solution Approaches**

1. Ion-exchange Treatment
2. Sorbplus Treatment
3. Primary Treatment Plant
4. Use Of Alternative Crude Oil
5. Sour Water Reuse And Recycle
6. Wildlife Safe Wetland Discharge
7. Research Mercury - Selenium Interaction Effects
8. Monitor Selenium Concentrations in Biota

## **Action Item E - Water management for salinity (Manucher Alemi)**

### **Title:**

Reduce the impairment of environmental, agricultural, and drinking water beneficial uses associated with salinity using water management techniques. (WQP p. 25)

### **Problem Statement:**

Water supply in the Delta and its tributaries may have elevated salt concentrations in excess of established water quality objectives to protect beneficial uses. Fish and wildlife may also be adversely impacted by elevated salinity. Surface and subsurface agricultural drainage are the major source of salt in the lower San Joaquin River Basin. Other sources of salts also exist.

1. Solution Approaches
2. Improve quality of water supply by intake or drainage discharge relocation
3. Agroforestry and salt use / disposal
4. Drainage Reduction (A2)
5. Real time management
6. DMC Circulation

## **Nutrients/sediments Group Report**

### **Members:**

Charlie Kratzer, US Geological Survey  
Peggy Lehman, Department of Water Resources  
Gail Louis, US EPA, CALFED  
Paul Marshall, CALFED  
Mike McElhine, USDA, Natural Resource Conservation Service  
Doug Morrison, US, Fish and Wildlife Service  
Rudy Schnagl, RWQCB, Central Valley Region  
Lynda Smith, Metropolitan Water District

## **Dissolved Oxygen Issues**

### *Problem Statement*

- Violations of D.O. standards over 10 mile reach of SJR plus Smith Canal, Mosher Slough, 5-Mile Slough, and Calaveras River in Stockton Area.
- May impair migration of adult fall run Chinook salmon up river between September and December
- Fish kills in Stockton area (SJR) and in above waterways following first flush storm.
- Factors controlling D.O. levels
- Temperature, SJR Flow, upstream algal production, BOD load from Stockton WWTP, sediment oxygen demand

### Data Gaps

- Contribution of sediment oxygen demand to low D.O.
- Factors controlling upstream algal production

### Desired goals

- 100 compliance with D.O. Standards
- Eliminate fish kills and possible impairment of salmon migration
- Reduce BOD load from point and non-point sources in Stockton
- Reduce upstream algal production
- Approaches to Solution
- RWQCB/Stockton re. NPDES Permit for WWTP
- Financial and technical assistance for implementing BMPs to control BOD loading from urban runoff and from upstream agricultural runoff.

## **Sediment Issues**

### Problem

- Sediment coming off ag lands during irrigation season and during winter storms carry nutrients (especially P) and OC pesticides to SJR (and to a lesser extent to Sacramento River)
- OC pesticides in fish filets consistently exceed NAS/NAE guidelines for fish-eating wildlife in SJR.

- Sediment from agricultural and urban runoff can physically affect aquatic life by smothering benthic organisms and eggs in spawning gravels.

#### Sources of sediment

- Agricultural lands (especially west side SJR), construction sites

#### Data Gaps

- urban runoff ?? (NPDES Stormwater Permits??)
- Sediment for agricultural land in Sacramento River Basin.

### **Drinking Water Group Report:**

#### Drinking Water Problems Opportunities for Water Quality Improvement

#### **Drinking Water: Source Water Quality Problems**

- Source water + treatment = drinking water
- If source water is too poor, treatment may be problematical
  - treated water may be unsafe
  - treated water may be unacceptable to consumers
  - treated water may not meet standards
  - operations may not be able to handle unusual water quality changes
- Enhanced Surface Water Treatment rules
- Interim ESWTR Proposed 7/94 for SW systems > 10,000 people
- Expect IESWTR promulgation 11/98
  - Enforceable by 11/01
  - Propose Long-term 1 ESWTR for SW systems < 10,000 people
- Filter backwash recycling by 8/00?
- Expect LT1 ESWTR promulgation 11/00
- Expect ICR-Based LT2 ESWTR promulgation 5/02
  - Enforceable about 5/05

#### **Proposed IESWTR Requirements in NODA**

- Cryptosporidium MCLG = 0
- 99% (2-log) filtration requirement for Cryptosporidium
- No disinfection requirement for Cryptosporidium
- Turbidity requirements tightened
  - Combined filter effluent <0.3 NTU 95%, never >1.0 NTU
  - many operational detail in discussion

- Sanitary surveys, correction of defects

### **Disinfectants and disinfection Byproduct Rules**

- Stage 1 D/DBPR proposed 7/94
- notice of M/DBP Data Availability 11/97
  - MCLs as proposed
  - Enhanced coagulation and operation as specified
  - Allows current SWTR disinfection credits
- D/DBP NODA 3/98
- Expect promulgation 11/98
  - Enforceable 11/01
- Expect stage 2 D/DBPR promulgation 5/02
  - Enforceable 5/05

### **Stage 1 D/DBPR Standards**

- Maximum contaminant Levels
  - 0.080 mg/l total trihalomethanes
  - 0.060 mg/l haloacetic acids (5)
  - 1.0 mg/l chlorite
  - 0.010 mg/l bromate
- Maximum Residual Disinfectant Levels
  - 4.0 mg/l chlorine (as Cl<sub>2</sub>)
  - 4.0 mg/l chloramine (as Cl<sub>2</sub>)
  - 0.8 mg/l chlorine dioxide (as ClO<sub>2</sub>)
- Action Level
  - 2.0 mg/l total organic carbon

### **Drinking water: Source Contaminants of Concern**

- Pathogens- direct public health problem
- Turbidity- direct compliance problem
- TOC, bromide - indirect problem (DBPs via treatment) for regulatory compliance, public health
- Nutrients/algae - indirect problem (T&O via treatment) for consumer acceptability
- Total Dissolved Solids/Salinity - direct problem for consumer acceptability

### **Drinking Water Where are the Points of Concern?**

- North Bay Aqueduct intake at Barker Slough
- Clifton Court Forebay at Banks Pumping Plant and South Bay Aqueduct
- San Luis reservoir
- Terminal branches and storage reservoirs of CA Aqueduct
- Contra Costa WD intakes at Mallard Slough, Rock Slough and Old River
- Tracy intake on Delta Mendota Canal

### **Possible Improvements to Source water Quality**

- North Bay Aqueduct

- Watershed management plan to control agricultural pathogen, TOC and turbidity loadings
- South Bay Aqueduct
  - Watershed Management to control agricultural nutrient loadings, algae
  - Copper sulfate treatment to control algae
  - Physical removal of algae

#### **Possible Improvements to Source Water Quality**

- Tracy intake on Delta Mendota Canal
  - Relocate agricultural drains to control TDS/salinity and TOC
  - Initiate management of drain operations to control TDS/salinity and TOC
  - Control marina and recreational boating discharges to reduce pathogen and MTBE loadings
  - Modify Tracy and other NPDES permits to include DW parameters of concern

#### **Possible Improvements to source Water Quality**

- Contra Costa WD intakes
  - Eliminate Veale Tract agricultural drainage into Rock Slough
  - Reduce local drainage into Old River

#### **Reservoirs**

- Eliminate whole body contact activities in reservoirs to control pathogen loadings
- Reduce flood-related agricultural runoff to control pathogens, nutrients and TOC

#### **Possible Improvements to source Water Quality**

- Regional Delta improvements
  - Relocate agricultural drains away from intakes to control TOC, Salinity/bromide
  - Enforce Clean Vessel Act, provide education to control pathogens, nutrients from recreational boaters
  - locate habitat restoration projects to minimize TOC at intakes
  - Revise/expand RWQCB control of wastewater and stormwater discharges of DW parameters of concern.

### **Pesticide Group Report:**

#### **Group members:**

Elaine Archibald, CUWA

Kati Buehler NCWA

J.P. Cativiela CRIA

Neil Dubrovsky, USGS

Chris Foe CVRWQCB

G. Fred Lee GFL&Assoc

Kathy Russick, SacCounty

Steve Murill, SD Murill & Assoc.

Bryan Stuart, Dow-Elanco

Marshall Lee, DPR

G. Fred Lee, G.Fred Lee Assoc

Charlie Kratzer, USGS

Val Connor, RWQCB

Paul Marshall, CALFED

Bill Crooks, WH Crooks

Robert Hosea, DFG

Stella Siepman, DFG

Charlie Huang, DFG

Kathy Goforth, EPA Region 9

Steve Shaffer, DFA  
Mike McElhine, USDA NRCS  
Niel Dubrovsky, USGS  
Gail Louis, EPA Region 9

Tom Mumley, RWQCB-Region 2  
Kathy Brunetti, DPR  
Prof. Mark Grismer, UC Davis

Steve Murrill presented an update of the work of the Pesticide subgroup. Steve Murrill read the problem statements on which consensus has been reached:

Certain pesticides have been identified in surface waters of the Bay/Delta estuary and its watersheds at levels that may impair aquatic life beneficial uses.

Current scientific knowledge is not adequate to determine the significance or extent of impairment.

Steve discussed the rationale behind the two statements. The first objectively defines the problem in a manner that would be durable within the CALFED Program. It describes what we know, and leads to CALFED to facilitate development and implementation of BMPs and other actions address the problem.

The second describes what we don't know, laying a foundation for an appropriate CALFED monitoring and research program.

The group will continue to "add meat to the bones" of this approach by briefly reviewing the existing regulatory framework, existing data (mainly related to diazinon and chlorpyrifos), and current scientific knowledge. The group will also identify scientific information gaps, and the need for research and monitoring.

The goal of the group is to develop a generic process to address surface water quality issues with regards to pesticide and then apply the process to the specific issue of diazinon and chlorpyrifos.

After several questions and comments from the WQTG, there seemed to be general support for this approach.

#### **WQTG Closing Comments**

At the close of the meeting, Rick Woodard expressed his appreciation for participants' efforts in the workgroups. Rick also announced that the next full Water Quality Technical Group meeting will be sometime the week of July 22nd - 25<sup>th</sup>.