California Regional Water Quality Control Board
Central Valley Region
Robert Schneider, Chair

Winston H. Hickox
Secretary for Environmental Protection

Gray Davis
Governor

Sacramento Main Office
Internet Address: http://www.swrcb.ca.gov/rwqcb5
3443 Routier Road, Suite A, Sacramento, California 95827-3003
Phone (916) 255-3000 • FAX (916) 255-3015

TO: Staff Assisting in 2002 303(d) List Update

FROM: Joe Karkoski
Sr. Land & Water Use Analyst

REGION 5 LISTING BACKGROUND INFORMATION

DATE: 21 May 2001

SIGNATURE: _____

SUBJECT: 2002 CLEAN WATER ACT (CWA) SECTION 303(D): PREPARATION OF RECOMMENDATIONS TO THE STATE WATER RESOURCES CONTROL BOARD FROM THE CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD

A. Introduction

Each of California's nine Regional Water Quality Control Boards has been asked to assist the State Water Resources Control Board in preparing an update to the State's Clean Water Act Section 303(d) list. The 303(d) list identifies surface waters not currently attaining water quality standards. The update to the 303(d) list may include additions of new water bodies and pollutants to the list; removal of water bodies and pollutants from list, if standards are attained; and changes to the description of water bodies currently listed (e.g. refinement of identified impaired reaches, changes in priority, etc).

This document describes the general factors that will considered in the preparation of Regional Board staff recommended changes to the 303(d) list for surface waters within the Central Valley Region. Regional Board staff will describe the specific factors for each recommended change in a Fact Sheet. This memo addresses the following topics: listing/ delisting factors, prioritization, documentation of the recommended changes, documents to be forwarded to the State Board, and public participation.

B. Listing Factors

Water bodies and associated pollutants should be recommended for addition to the 303(d) list if any one of these factors is met:

1. Effluent limitations or other pollution control requirements [e.g., Best Management Practices (BMPs)] are not stringent enough to assure protection of beneficial uses and attainment of

SWRCB and RWQCB objectives, including those implementing SWRCB Resolution Number 68-16 "Statement of Policy with Respect to Maintaining High Quality of Waters in California" [see also 40 CFR 130.7(b)(1)]. This does not apply to non-attainment related solely to discharge in violation of existing WDR's or NPDES permit.

2. Fishing, drinking water, or swimming advisory currently in effect. This does not apply to advisories related to discharge in violation of existing WDR's or NPDES permit.

3. Beneficial uses are impaired or are expected to be impaired within the listing cycle (i.e. in next four years). Impairment is based upon evaluation of chemical, physical, or biological integrity. Impairment will be determined by "qualitative assessment", physical/ chemical monitoring, bioassay tests, and/or other biological monitoring. Applicable Federal criteria and the Regional Board's Basin Plan water quality objectives determine the basis for impairment status.

4. The water body is on the previous 303(d) list and either: (a) monitoring continues to demonstrate a violation of objective(s) or (b) monitoring has not been performed.

5. Data indicate tissue concentrations in consumable body parts of fish or shellfish exceed applicable tissue criteria or guidelines. Criteria or guidelines related to protection of human and wildlife consumption include, but are not limited to, U.S. Food and Drug Administration Action Levels, National Academy of Sciences Guidelines, U.S. Environmental Protection Agency tissue criteria.

C. Delisting Factors

Water bodies may be removed from the list for specific pollutants or stressors if any one of these factors is met:

1. Objectives are revised (for example, Site Specific Objectives), and the exceedence is thereby eliminated.

2. A beneficial use is de-designated after U.S. EPA approval of a Use Attainability Analysis, and the non-support issue is thereby eliminated.

3. Faulty data led to the initial listing. Faulty data include, but are not limited to, typographical errors, improper quality assurance/quality control (QA/QC) procedures, or limitations related to the analytical methods that would lead to an improper conclusions regarding the water quality status of the water body.

4. It has been documented that the objectives are being met and beneficial uses are not impaired based upon an evaluation of available monitoring data. This evaluation should discuss

foreseeable changes in hydrology, land use, or product use and describe why such changes should not lead to future exceedance.

5. A TMDL has been approved by the U.S. Environmental Protection Agency for that specific water body and pollutant (see 40 CFR 130.7(b)(4)).

6. There are control measures in place which will result in protection of beneficial uses. Control measures include permits, clean up and abatement orders, and Basin Plan requirements which are enforceable and include a time schedule (see 40 CFR 130.7(b)(1)(iii).

D. Evaluation Criteria

In general, the following hierarchy should be used in evaluating data relative to applicable water quality objectives:

1. Applicable numeric water quality objectives (contained in the Basin Plan) or water quality standards (contained in the federal California and National Toxics Rules). Both the Basin Plan and federal rules governing a specific parameter should be read carefully, since there can be site specific applications or exceptions.

2. Criteria developed by the U.S. Environmental Protection Agency, California Department of Fish, and the California Department of Health Services and other applicable criteria developed by government agencies. Such criteria will be used to interpret narrative water quality objectives.

3. Guidance or guidelines developed by agencies/entities such as the U.S. Food and Drug Administration, National Academy of Sciences, and the Agency for Toxic Substances and Disease Registry and the California Department of Health Services. Guidelines developed by other agencies should be thoroughly reviewed before applied, since the assumptions and risk factors considered may not be consistent with Regional Board water quality objectives.

4. Criteria or standards developed in other states, regions, or countries. Such criteria should be used with caution. The environmental setting, assumptions, and risk factors considered may not be consistent with Regional Board water quality objectives.

5. Findings in peer-reviewed literature, listing decisions made in similar settings within the State, and/or "weight of evidence" based on information and evaluations performed by outside agencies or groups. Generally, a more extensive description will be needed to justify the impairment (or lack of impairment) determination. Clear links should be described between the literature, findings in similar settings, or outside evaluations and the non-attainment of water quality objectives.

There are no specific minimum data requirements or a specific frequency of exceedance for making a finding that water quality objectives are not attained. In general, more data is needed to interpret environmental results that are very specific to time and geography. Less data would be needed to make a determination based on environmental results that serve as integrators over space or time. So more water column chemistry data would generally be needed to determine impairment than fish tissue chemistry data. Also less water column chemistry data may be needed to make an impairment determination (or lack of impairment determination) if there is other information to support the findings from the water column chemistry (e.g. correlations could be made between pesticide use patterns and the presence of pesticides in surface water).

E. Priority Ranking

A priority ranking is required for listed waters to guide TMDL planning pursuant to 40 CFR 130.7. TMDLs will be ranked into high (H), medium (M), and low (L) priority categories based on:

1. water body significance (such as importance and extent of beneficial uses, threatened and endangered species concerns and size of water body)

2. degree of impairment or threat (such as number of pollutants/stressors of concern, and number of beneficial uses impaired)

3. conformity with related activities in the watershed (such as existence of watershed assessment, planning, pollution control, and remediation, or restoration efforts in the area)

4. potential for beneficial use protection or recovery

5. degree of public concern and involvement

6. availability of funding and information to address the water quality problem

7. overall need for an adequate pace of TMDL development for all listed waters

8. other water bodies and pollutants have become a higher priority

It should be noted that the criteria can be applied in different ways to different water bodies and pollutants. For example, a water body may be severely impaired, but if there is little likelihood of beneficial use recovery than a lower priority might be given.

F. Documentation

A 303(d) update fact sheet should be prepared for each discrete 303(d) listing or delisting decision (see attached template).

1. Fact Sheets for Listing Decisions

Each fact sheet for decisions to add water bodies and pollutants to the 303(d) list should include the following information: Waterbody name, hydrologic unit number, total water body size, pollutant(s)/stressor(s) causing impairment, likely sources, TMDL Development Priority; Size Affected; TMDL Development Start Date; TMDL Development End Date (based on anticipated date for consideration of a Basin Plan Amendment by the Regional Board); the latitude and longitude of the upstream and downstream impaired stream segment and/or a specific narrative description of the impaired segment; a description of the characteristics of the watershed (e.g. flow diversions, rainfall, land uses); the specific water quality objective(s) not being met; a summary of the data assessment that led to the decision to list; the criteria applied to the decision to list; a description of the rationale for the priority ranking; and a bibliography of the information sources used to make the listing decision.

2. Fact Sheets for Delisting Decisions

Each fact sheet for decisions to delete water bodies and pollutants from the 303(d) list should include the following information (see example): the water body name, pollutant(s)/stressor(s) previously identified as having caused an impairment; a summary of the data or information that lead to the decision to delist; the criteria applied to the decision to delist; and a bibliography of the information sources used to make the delisting decision.

3. Fact Sheets to Document Changes to Currently Listed Water bodies/Pollutants

Fact sheets to document changes to currently listed water body/pollutant should focus on the proposed change (e.g. if there is a proposed change in priority, there is no need to describe the extent of impairment). A single fact sheet may be used to document similar changes (e.g. a group of water bodies whose priorities are changing for a similar reason).

4. Files

For each recommended change, a file should be created to support that change. The file should include: a copy of the Fact Sheet and copies of the data or information used to support the recommendation. Selected data or information from reports can be copied, as long as the cover sheet from the report is provided. For data retrieved electronically, the source and date of retrieval should be clearly recorded.

G. Public Participation

Regional Board staff has conducted 3 workshops during the time frame for solicitation of information. The workshops were in Fresno, Sacramento, and Redding. It is anticipated that there will be several more opportunities for public participation after staff has prepared its draft recommendations. The anticipated schedule for Regional Board and State Board action on the 303(d) list is described below:

Process Step	Regional Board	State Board
Public Review of Draft staff Recommended changes to the 303(d) List	Aug 15, 2001 – October 15, 2001	December 2001 – February 2002
Board Meeting	January 2002	March 2002
Comments on EPA Proposed Action		May – June 2002

Although official Regional Board action is not required (only State Board action is required), it is anticipated that the Regional Board will take action to transmit the recommended changes to the 303(d) list to the State Board. As part of that process, we will likely have a public meeting for formal Board action and we will prepare a responsiveness summary. The responsive summary will include a written response to all written comments on the draft 2002 303(d) list received by the cut-off date that is established.

303(d) List Update Process and Issues

Process for writing and reviewing Fact Sheets

1. Gene Davis will be the main contact for tracking who is reviewing which issues and tracking the documents being evaluated.
2. Suggested division of evaluation:
    a. Mercury/other bioaccumulatives (whole Valley)
    b. Pesticides (whole Valley)
    c. Sediment/ temperature (north Valley)
    d. Dissolved oxygen/nutrients (Delta/San Joaquin Valley)
    e. Metals (whole Valley)
    f. Drinking water/pathogens (whole Valley)
    g. Other pollutants (north Valley/above the dams)
    h. Other pollutants (Sac Valley/Delta)
    i. Other pollutants (San Joaquin Valley)
    j. Other pollutants (Tulare Lake)

For each category, staff assigned to do the evaluations will be responsible for proposals for listing, delisting, and changes to currently listed waters.

3. For each main group of pollutants (a-f), write two fact sheets (these can address proposed listing and delistings). This should be completed within two weeks.
4. In addition to fact sheets, the relevant portions of information sources used should be copied and put into a file. Files will also be created for "non-listings" (i.e. where the review of submitted data indicates that no action is needed).
5. Meet to review completed fact sheets for consistency and to address any issues that come up.
6. Complete the rest of the fact sheets. Submit to Joe for review. Jerry will provide final review and approval of fact sheets for inclusion in the staff report.

Proposed Timeline

Task	Completion Date
Agree on process/assignments	5/21/01
Complete example fact sheets	6/14/01
Review completed fact sheets	6/18/01
Complete all fact sheets for recommended changes to 303(d) list	8/17/01
Complete administrative draft staff report for legal/mgmt review	8/24/01
Complete draft for public review	9/4/01
Conduct public workshops	9/01
End public comment period	10/17/01
Review public comments/make changes to recommendations/prepare responsiveness summary	11/17/01
Legal/mgmt review of changes	12/14/01
Board meeting	1/02

Suggested Assignments

Category	Unit/Group
a. Mercury/other bioaccumulatives (whole Valley)	Morris
b. Pesticides (whole Valley)	Karkoski
c. Sediment/ temperature (whole Valley)	Karkoski
d. Dissolved oxygen/nutrients (Delta/San Joaquin Valley)	Grober
e. Metals (whole Valley)	Morris
f. Drinking water/pathogens (whole Valley)	Rasmussen
g. Toxicity (whole Valley)	Karkoski
h. Other pollutants (Sac Valley/Delta)	Karkoski
i. Other pollutants (San Joaquin Valley)	Grober
j. Other pollutants (Tulare Lake/upper SJR watershed)	Wass

Policy Issues

1. Consideration of constructed facilities/ag drains

We should use the categorization that Jeanne Chilcott put together for the ISWP.
Category "B" waters (ag dominated natural streams) would be candidates for listing.
Category "C1" waters (constructed ag supply canals) would be candidates for listing due to ag-related supply water beneficial uses.
Category "C2" waters (constructed ag drains) would not be candidates for listing.
Category "C3" waters (natural modified channels) would be evaluated on a case-by-case basis.

2. Prioritization/Scheduling

In addition to criteria described in the guidance memo, high priority should be given to TMDLs that we think we will work on in the next 5 years, medium priority to those TMDLs we may work on in the next 6-10 years, and low priority to those TMDLs that will be worked on beyond 10 years.

2002 303(d) Fact Sheet Template (RB5 ADMINSTRATIVE DRAFT)
(Specify Here – Addition, Deletion or Change, along with Waterbody/Pollutant Combination being Addressed)

Summary of Proposed Action

A brief summary of the proposed action should be included (is this a change, addition or deletion).

303(d) Listing/TMDL Information

If an existing listed waterbody, changes to the table below should be in strikeout/underline format. Lat/Long are not required, but can be especially helpful when developing the TMDL or establishing permit conditions.

Waterbody Name	Arcade Creek	**Pollutants/Stressors**	Diazinon
Hydrologic Unit	519.21	**Sources**	Urban runoff/Atmospheric deposition
Total Waterbody Size	10 miles	**TMDL Priority**	~~Medium~~ High
Size Affected	10 miles	**TMDL Start Date (Mo/Yr)**	01/98
Extent of Impairment	All of Arcade Creek	**TMDL End Date (Mo/Yr)**	12/11
Upstream Extent Latitude	38° 40' 28"	**Upstream Extent Longitude**	121° 13' 58"
Downstream Extent Latitude	38° 36' 11"	**Downstream Extent Longitude**	121° 30' 52"
Original 303(d) Listing Year	1998		

Watershed Characteristics

This should include a brief description of the major characteristics of the watershed and the waterbody described by the Fact Sheet.

Water Quality Objectives Not Attained (or Objectives being Attained for Deletion)

Specific reference to the water quality objectives in the Basin Plan (or California or National Toxics Rule) not being attained should be made. If a narrative objective is not attained, the applicable criteria or guidelines being used should be described.

2002 303(d) Fact Sheet Template (RB5 ADMINSTRATIVE DRAFT)
(Specify Here – Addition, Deletion or Change, along with Waterbody/Pollutant Combination being Addressed)

Evidence of Impairment

The data demonstrating impairment should be described here (or data demonstrating attainment). A summary of the data/information (including references), along with a comparison to water quality objectives should be provided.

Extent of Impairment (or Extent of Attainment)

The specific stream reach that is impaired should be described (from where specifically to where specifically – if a lake or reservoir, what specific area). Any inferences drawn in determining the extent of impairment based on sampling location, land uses, or other watershed characteristics should be described here.

Potential Sources

The potential sources of the pollutant should be described here. Try to distinguish between suspected sources and known sources (e.g. available data indicates that urban storm drains have levels of diazinon several times higher than creek levels versus urban land use are a suspected source since 80% of the watershed is commercial/residential and diazinon is a commonly used pesticide for pest control on lawns and landscape).

TMDL Priority

The rationale for the priority ranking must be given. The TMDL priority (high, medium, low) must take into account the severity of the pollution problem and the beneficial uses of the waterbody. Other rationales that could be applied include: community interest in addressing the problem; other resources/agencies working on the problem; available funding; the need to develop TMDLs at an adequate pace.

Information Sources

The references or information sources used to develop the recommended action should be described here. Use the references template developed by Michelle Wood.

LAKE ENGLEBRIGHT, MERCURY
2002 303(d) Fact Sheet
Listing

Summary of Proposed Action

The Environmental Protection Agency's (EPA) National Clarifying Guidance for 1998 State and Territory Clean Water Act Listing Decisions states that a waterbody should be placed on the 303(d) list if the waterbody does not meet all applicable water quality standards, including numeric and narrative criteria and designated uses. Based on the federal guidance, the Central Valley Regional Water Quality Control Board (CVRWQCB) adds Lake Englebright to the 2002 303(d) list.

Table 1. 303(d) Listing/TMDL Information

Waterbody Name	Lake Englebright	**Pollutants/Stressors**	Mercury
Hydrologic Unit	517.14	**Sources**	Gold Mine Drainage
Total Length	815 acres	**TMDL Priority**	Medium
Size Affected	815 acres	**TMDL Start Date (Mo/Yr)**	01/04
Extent of Impairment	All of Lake Englebright	**TMDL End Date (Mo/Yr)**	12/11
Upstream Extent Latitude	N 39° 18' 42"	**Upstream Extent Longitude**	W 121° 12' 18"
Downstream Extent Latitude	N 39° 14' 24"	**Downstream Extent Longitude**	W 121° 16' 09"
Original 303(d) Listing Year	2002		

Watershed Characteristics

The Yuba River basin has over 12700 watershed acres and over 1900 total river miles. Water usage ranges from recreational to agricultural and municipal to hydroelectric generation, among others. The basin is bound by the Feather River basin on the north, by the Little Truckee River basin on the east, and by the Bear River and American River basins on the south. The headwaters are located in the Sierra Nevada snowfields at elevations ranging up to 9,100 feet above sea level. The North Fork of the Yuba River flows into Bullard's Bar Reservoir. Water is released at the Bullard's Bar Dam to and goes downstream to join flows from the Middle and South Forks of the Yuba River, which flow into Englebright dam. From the Englebright dam some water is diverted to a North and South Irrigation ditch but the majority continues down stream through Marysville and flows into the Feather River.

Water Quality Objectives Not Attained

The narrative objective for toxicity is not being attained for mercury in Lake Englebright. The narrative toxicity objective in the Basin Plan states, in part, "All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life." The narrative toxicity objective further states that "The Regional Water Board will also consider ... numerical criteria and guidelines for toxic substances developed by the State Water Board, the California Office of Environmental Health Hazard Assessment, the California Department of Health Services, the U.S. Food and Drug Administration, the National Academy of Sciences, the U.S. Environmental Protection Agency, and other appropriate organizations to evaluate compliance with this objective." (CRWQCB-CVR, 1998; http://www.swrcb.ca.gov/~rwqcb5/bsnplnab.pdf).

Numeric criteria for mercury in water and fish tissue have been developed for both human health and wildlife protection. The California Toxics Rule (CTR) lists a criterion of 0.05 micrograms per liter (µg/L) (parts per billion [ppb]) of mercury for freshwater sources of drinking water (for human consumption of water and/or aquatic organisms) (USEPA, 2000). The U.S. Environmental Protection Agency (USEPA) and the California Department of Health Services determined a primary maximum contaminant level (MCL) of 2.0 ppb of mercury for drinking water (Marshack, 2000). In addition, the USEPA established a recommended ambient water quality criterion of 1.4 ppb total mercury (maximum concentration, 1-hour average) for the protection of freshwater aquatic wildlife (USEPA, 1999).

LAKE ENGLEBRIGHT, MERCURY
2002 303(d) Fact Sheet
Listing

The National Academy of Sciences-National Academy of Engineering (NAS) mercury guideline of 0.5 (µg/g) (parts per million [ppm]) (NAS, 1973) applies to whole, freshwater fish and marine shellfish. The United States Food and Drug Administration (FDA) action level of 1.0 ppm (FDA, 1984) applies to the edible portion of commercially caught freshwater and marine fish. In addition, the USEPA recently established a criterion of 0.3 ppm methylmercury in the edible portions of fish for human health protection (USEPA, 2001). The USEPA has also established wildlife criteria for the Great Lakes Water Quality Initiative (USEPA, 1995) and the Mercury Study Report to Congress (USEPA, 1997). These criteria suggest that a range of mercury in fish tissue of 0.08 ppm (trophic level 3 [TL3] fish) to 0.35 ppm (trophic level 4 [TL4] fish) should be protective of wildlife (USEPA, 1997). Because wildlife generally consume lower trophic level (and smaller) fish, the human health and wildlife criteria are not directly comparable.

Evidence of Impairment

Two sets of fish-tissue data are available for Lake Englebright: (1) data collected by the U.C. Davis Division of Environmental Studies (UCD) in 1996, and (2) data collected by the U.S. Geological Survey (USGS) in 1999. The data is summarized in Table 2, below. Based on the USGS data, Placer, Yuba, and Nevada counties have issued an interim public health notification with the cooperation of OEHHA who are in the process of developing a state advisory.

Table 2. Summary of Mercury Concentrations in Fish Tissue Samples from Lake Englebright

Data Source	Sample Year	Number of Samples	Mean Mercury Concentration	Range Mercury Concentration	Percent Samples Above USFDA Criteria (1.0 ppm)	Percent Samples Above NAS Guideline (0.5 ppm)	Percent Samples Above USEPA Criterion (0.3 ppm)
UCD[1]	1996	9	0.62 ppm	0.41 – 0.89 ppm	0 %	78 %	100 %
USGS[2]	1999	21	0.51 ppm	0.08 – 0.96 ppm	0 %	67 %	81 %

[1] Data taken from Slotten etal. *Gold Mining Impacts on Food Chain Mercury in Northwestern Sierra Nevada Streams (1996 Revision).*

[2] Data taken from May etal. *Mercury Bioaccumulation in Fish in a Region Affected by Historic Gold Mining: The South Yuba River, Deer Creek, and Bear River Watersheds, California, 1999.*

Extent of Impairment

Englebright Dam is located in the Sierra foothills 21 miles east of Marysville on State Highway 20. Englebright Dam was constructed primarily to prevent upstream hydraulic mining debris from moving downstream into the Yuba River floodplain. Construction of the dam began in 1938 and was completed in 1941. The dam is a concrete constant angle arch dam, 260 feet tall, and 1,142 feet in length. Englebright Lake is about 227 feet deep at the dam and covers 815 surface acres. It is 9 miles in length and has 24 miles of shoreline. The entire waterbody is impaired by mercury.

Potential Sources

Several inactive and partially active gold mines exist upstream of Englebright Dam in the Yuba River watershed. The Yuba watershed was historically mined extensively for its hardrock and placer gold deposits and has been affected by hydraulic mining (Alpers, 2000). The mines are characterized as alkaline, arsenic containing drainage (Montoya, 1992).

TMDL Priority

Lake Englebright should be listed as medium priority because tissue concentration samples approach the USFDA criteria of 1.0 ppm with a majority of the samples are above the NAS and USEPA criteria.

Information Sources

Alpers, C.N., M.P. Hunerlach. 2000. *Mercury Contamination from Historic Gold Mining in California.* U.S. Geological Survey. Fact Sheet FS-061-00. May 2000.

CRWQCB-CVR (California Regional Water Quality Control Board, Central Valley Region). 1998. *The Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board, Central Valley Region — The Sacramento River Basin and the San Joaquin River Basin.* Fourth Edition.

FDA (U.S. Food and Drug Administration). 1984. *Shellfish Sanitation Interpretation: Action Levels for Chemical and Poisonous Substances*. USFDA, Shellfish Sanitation Branch. Washington, DC. June 1984.

Marshack, J.B. 2000. *A Compilation of Water Quality Goals*. California Regional Water Quality Control Board, Central Valley Region Report. August 2000, updated February 8, 2001.

May, J.T., R.L. Hothem, C.N. Alpers, M.A. Law. 2000. *Mercury Bioaccumulation in Fish in a Region Affected by Historic Gold Mining: The South Yuba River, Deer Creek, and Bear River Watersheds, California, 1999*. U.S. Geological Survey. Sacramento, CA. 2000.

Montoya, B. and X. Pan. 1992. *Inactive Mine Drainage in the Sacramento Valley, California*. California Regional Water Quality Control Board, Central Valley Region Report. July 1992.

NAS (National Academy of Science-National Academy of Engineers). 1973. *A Report of the Committee on Water Quality. Water quality criteria, 1972*. U.S. Environmental Protection Agency. EPA R3-73-033.

Slotton, D.G., S.M. Ayers, J.E. Reuter, C.R. Goldman. 1996. *Gold Mining Impacts on Food Chain Mercury in Northwestern Sierra Nevada Streams (1996 Revision)*. Division of Environmental Studies, University of California, Davis. December 1996.

SWRCB (State Water Resources Control Board). 1999. *1998 California 303(d) List and Priority Schedule*. Approved by U.S. Environmental Protection Agency, Region 9. May 12, 1999. (http://www.swrcb.ca.gov/tmdl/docs/303d98.pdf).

USEPA (United States Environmental Protection Agency). 1995. *Great Lakes Water Quality Initiative Technical Support Document for Wildlife Criteria*. EPA-820-B-95-009. U.S. Environmental Protection Agency, Office of Water. March 1995.

USEPA. 1997. *Mercury Study Report to Congress, Vol. 6. An Ecological Assessment for Anthropogenic Mercury Emissions in the United States*. U.S. Environmental Protection Agency, Office of Air Quality Planning & Standards and Office of Research and Development. Washington, DC.

USEPA (Office of Water), 1997. *National Clarifying Guidance For 1998 State and Territory Clean Water Act Section 303(d) Listing Decisions*. August 17, 1997. http://www.epa.gov/owow/tmdl/lisgid.html

USEPA. 1999. *National Recommended Water Quality Criteria – Correction*. EPA 822-Z-99-001. April 1999. U.S. Environmental Protection Agency, Office of Water. Washington, DC. (http://www.epa.gov/ost/pc/revcom.pdf).

USEPA. 2000. *Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule*. U.S. Environmental Protection Agency, 40 CFR, Part 131, *in* Federal Register, Volume 65, No. 97. Thursday, May 18, 2000.

USEPA. 2001. *Water Quality Criterion for Protection of Human Health: Methylmercury*. EPA-823-R-01-001. U.S. Environmental Protection Agency, Office of Science and Technology. January 2001.

Wyels, W. 1987. *Regional Mercury Assessment*. California Regional Water Quality Control Board, Central Valley Region. March 1987.

SAN JOAQUIN RIVER, DDT
2002 303(d) Fact Sheet
Delisting

Summary of Proposed Action

The Environmental Protection Agency's (EPA) National Clarifying Guidance for 1998 State and Territory Clean Water Act Listing Decisions states that a waterbody may be removed from the 303(d) list if the waterbody meets all applicable water quality standards, including numeric and narrative criteria and designated uses. Based on the federal guidance, the Central Valley Regional Water Quality Control Board (CVRWQCB) removes the San Joaquin River for DDT from the 303(d) list.

303(d) Listing/TMDL Information

Waterbody Name	San Joaquin River	**Pollutants/Stressors**	DDT
Hydrologic Unit	~~544.00~~, 541.10, 535.30	**Sources**	Agriculture
Total Waterbody Size	330 miles	**TMDL Priority**	Low
Size Affected	130 miles	**TMDL Start Date (Mo/Yr)**	01/04
Extent of Impairment	Mendota Pool to Vernalis	**TMDL End Date (Mo/Yr)**	12/11
Upstream Extent Latitude	36° 47' 17.3"	**Upstream Extent Longitude**	120° 22' 21.5"
Downstream Extent Latitude	37° 40' 32.6"	**Downstream Extent Longitude**	121° 15' 54"
Original 303(d) Listing Year	1992		

Watershed Characteristics

The Sierra Nevada Mountains, Coast Ranges, the Delta, and Tulare Lake Basin surround the San Joaquin River watershed. From its source in the Sierra Nevada Mountains, the San Joaquin River flows southwesterly until it reaches Friant Dam (SJVDP, 1990). Below Friant Dam, the San Joaquin River flows westerly to the center of the San Joaquin Valley near Mendota, where it turns northwesterly to eventually join the Sacramento River in the Delta. The main stem of the entire San Joaquin River is about 300 miles long and drains approximately 13,500 square miles.

Water Quality Objectives Attained

The narrative objectives for pesticides and toxicity are attained for DDT in the San Joaquin River. The narrative objective for pesticides states, "No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses." It further states "discharges shall not result in pesticide concentrations in bottom sediments or aquatic life that adversely affect beneficial uses." The narrative toxicity objective in the Basin Plan states, in part, "All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life." The narrative toxicity objective further states that "The Regional Water Board will also consider ... numerical criteria and guidelines for toxic substances developed by the State Water Board, the California Office of Environmental Health Hazard Assessment, the California Department of Health Services, the U.S. Food and Drug Administration, the National Academy of Sciences, the U.S. Environmental Protection Agency, and other appropriate organizations to evaluate compliance with this objective." (CRWQCB-CVR, 1998; http://www.swrcb.ca.gov/~rwqcb5/bsnplnab.pdf)

DDT was banned for use as a pesticide in the United States in 1972. It does not dissolve well in water, binds strongly to soil, and in soil breaks down into the metabolites DDD and DDE (USDHHS, 1995). The Environmental Protection Agency (USEPA) uses the sum of DDTs, including its metabolites and isomers, to derive total concentrations (Davis et al, 2000). USEPA classifies DDT and its metabolites as probable carcinogens (USEPA, 2000). The United States Academy of Sciences-National Academy of Engineering (NAS) numeric guideline of 1000 ng/g (parts per billion (ppb)), applies to whole fish for the protection of fish-eating wildlife (NAS, 1973). The United States Food and Drug Administration (FDA) set 5000 ppb as its action level (AL) for the edible portion (filet) of commercial freshwater and marine fish (FDA, 1984). The Office of Environmental Health Hazard Assessment (OEHHA) uses a screening value (SV) of 100 ppb (OEHHA, 1999) and USEPA uses a screening value of 300 ppb (USEPA, 2000).

SAN JOAQUIN RIVER, DDT
2002 303(d) Fact Sheet
Delisting

Evidence of Attainment

DDT concentrations have declined since the 1970s and 1980s (Davis et al, 2000). The Toxic Substances Monitoring Program (TSMP) and the San Francisco Estuary Institute (SFEI) collected fish tissue samples between 1978 and 1998 in the lower San Joaquin River. Data presented in 1998 are significantly lower than those collected between 1978 and 1990. None of the fish tissue analyzed by the San Francisco Estuary Institute (SFEI) exceeded USFDA action levels or NAS guidelines. Results from the Toxic Substance Monitoring Program (TSMP) and SFEI fish tissue collections are presented in Table 1.

Table 1. Summary of DDT Concentrations in Fish Tissue Samples

Data Source	Sample Years	Number of Samples	Mean DDT Concentration	Range DDT Concentration	Criteria [1]		Percent Samples Above Criteria
TSMP	1978-1990	36	1312.2 ppb	5.1 - 7267 ppb	USFDA-AL NAS USEPA-SV OEHHA-SV	5000 ppb 1000 ppb 300 ppb 100 ppb	6% 44% 75% 81%
SFEI	1998	13	79.3 ppb	17 - 389 ppb	USFDA-AL NAS USEPA-SV OEHHA-SV	5000 ppb 1000 ppb 300 ppb 100 ppb	0% 0% 8% 23%

[1] USFDA-AL = United States Food and Drug Administration action level.
NAS = National Academy of Sciences guideline
USEPA-SV= United States Environmental Protection Agency screening value.
OEHHA-SV = Office of Environmental Health Hazard Assessment screening value.

Extent of Attainment

San Joaquin River was originally placed on the 303(d) list in 1992 due to high DDT concentrations in fish tissue. Approximately 130 miles of the Lower San Joaquin River, between the Mendota Dam and Vernalis, are currently listed as impaired by DDT. This 130-mile reach of the Lower San Joaquin River drains approximately 4,530 square miles (2.9 million acres) in portions San Joaquin, Merced, Stanislaus, Tuolumne, Madera, Mariposa, and Fresno counties. The major tributaries to the Lower San Joaquin River are on the east side of the San Joaquin Valley, with drainage basins in the Sierra Nevada Mountains. These major east side tributaries are the Stanislaus, Tuolumne, and Merced Rivers. Several smaller, ephemeral streams flow into the San Joaquin River from the west side of the valley. These streams include Hospital, Ingram, Del Puerto, Orestimba, San Luis, and Los Banos Creeks. Mud Slough (north) and Salt Slough also drain the Grassland Watershed on the west side of San Joaquin Valley. The entire 130-mile segment of the San Joaquin River attains USFDA's and NAS' criteria for DDT.

Information Sources

Brodberg, R.K., G.A Pollock. 1999. *Prevalence of Selected Target Chemical Contaminants in Sport Fish from Two California Lakes: Public Health Designed Screening Study.* Office of Environmental Health Hazard Assessment, Pesticide and Environmental Toxicology Section. June 1999.

CVWQCB-CVR (California Regional Water Quality Control Board, Central Valley Region), 1998. *The Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board, Central Valley Region – The Sacramento River Basin and the San Joaquin River Basin.* Fourth Edition.

Davis, J.A., M.D. May, G. Ichikawa, and D. Crane. 2000. *Contaminant Concentrations in Fish from the Sacramento-San Joaquin Delta and Lower San Joaquin River, 1998.* San Francisco Estuary Institute, Richmond, CA. September 1998

Marshack, J.B., 2000. *A Compilation of Water Quality Goals.* California Regional Water Quality Control Board, Central Valley Region Report, August 2000, updated February 8, 2001.

NAS (National Academy of Science)-NAE (National Academy of Engineers), 1973. *A Report of the Committee on Water Quality. Water quality criteria, 1972.* U.S. Environmental Protection Agency. EPA R3-73-033.

SJVDP (San Joaquin Valley Drainage Program). *1990b. A management Plan for Agricultural Drainage and Related Problems on the West Side of the San Joaquin Valley. Vol. I and II.* Prepared by the San Joaquin Valley Drainage Program. Sacramento, CA.

SWRCB-DWQ (State Water Resources Control Board, Division of Water Quality), 1995. *Toxic Substances Monitoring Program: Freshwater Bioaccumulation Monitoring Program: Data Base (Org_Wet).*

SWRCB (State Water Resources Control Board), 1999. *1998 California 303(d) List and Priority Schedule.* Approved by U.S. Environmental Protection Agency, Region 9; May 12, 1999. http://www.swrcb.ca.gov/tmdl/docs/303d98.pdf.

USDHHS-ATSDR (United States Department of Health and Human Services, Agency for Toxic Substances and Disease Registry), 1995. *ToxFAQs - DDT, DDE, and DDD.* September 1995. http://www.atsdr.cdc.gov/tfacts35.html.

USEPA (Office of Science and Technology, Office of Water), 2000. *Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories. Volume 1: Fish Sampling and Analysis.* Third Edition.

USEPA (Office of Water), 1997. *National Clarifying Guidance For 1998 State and Territory Clean Water Act Section 303(d) Listing Decisions.* August 17, 1997. http://www.epa.gov/owow/tmdl/lisgid.html

USFDA (United States Food and Drug Administration-Shellfish Sanitation Branch). 1984. *Shellfish Interpretation: Action Levels for Chemical and Poisonous Substances.* June 21, 1984.