

Amendments to the 1994 Water Quality Control Plan for the
Sacramento River and San Joaquin River Basins

Subject	Date Adopted By Reg. Bd.	Regional Board Resolution No.	Date in Effect
1. Amendment Specifically Authorizing Compliance Schedules in NPDES Permits for Achieving Water Quality Objectives or Effluent Limits Based on Objectives	5/26/95	95-142	5/26/95*
2. Adoption of Water Quality Objectives and an Implementation Plan Regulation of Agricultural Subsurface Drainage in the Grassland Area	5/3/96	96-147	1/10/97*
3. Adoption of Site Specific Water Quality Objectives for pH and Turbidity for Deer Creek in El Dorado County	7/19/02	R5-2002-0127	10/21/03
4. Adoption of Corrective Language	9/6/02	R5-2002-0151	1/27/04
5. Adoption of a Control Program for Mercury in Clear Lake, including COMM use for Clear Lake and Mercury Objectives for Fish Tissue	12/6/02	R5-2002-0207	10/2/03
6. Adoption of a Control Program for Orchard Pesticide Runoff and Diazinon Runoff into the Sacramento and Feather Rivers, including Site-Specific Water Quality Objectives for Diazinon	10/16/03	R5-2003-0148	8/11/04
7. Adoption of Site Specific Temperature Objectives for Deer Creek in El Dorado And Sacramento Counties	1/31/03 9/16/05	R5-2003-0006 R5-2005-0119	5/17/06
8. Amendment for the Control of Salt and Boron Discharges into the Lower San Joaquin River	9/10/04	R5-2004-0108	7/28/06
9. Amendment to De-Designate Four Beneficial Uses of Old Alamo Creek, Solano County	4/28/05	R5-2005-0053	8/7/06

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Subject	Date Adopted By Reg. Bd.	Regional Board Resolution No.	Date in Effect
10. Amendment for the Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the Stockton Deep Water Ship Channel	1/27/05	R5-2005-0005	8/23/06
11. Amendment for the Control of Diazinon and Chlorpyrifos Runoff into the San Joaquin River	10/21/05	R5-2005-0138	12/20/06
12. Amendment for the Control of Mercury in Cache creek, Bear Creek, Sulphur Creek and Harley Gulch	10/21/05	R5-2005-0146	2/6/07
13. Amendment for the Control of Nutrients in Clear Lake	6/23/06	R5-2006-0060	7/12/07
14. Amendment for the Control of Diazinon and Chlorpyrifos Runoff into the Sacramento-San Joaquin Delta	6/23/06	R5-2006-0061	10/10/07
15. Amendment for the Control of Diazinon and Chlorpyrifos Runoff into the Sacramento and Feather Rivers	5/3/07	R5-2007-0034	8/11/08
16. Amendment to Revise Water Quality Objectives for pH and Turbidity	10/25/07	R5-2007-0136	7/7/09
17. Amendment to Determine Certain Beneficial Uses are not Applicable and Establish Water Quality Objectives in Sulphur Creek, Colusa County	3/16/07	R5-2007-0021	9/4/09

* The amendment is not in effect until it is approved by the State Water Resources Control Board and Office of Administrative Law. If the amendment involves adopting or revising a standard which relates to surface waters it must also be approved by the U.S. Environmental Protection Agency (USEPA) [40 CFR Section 131(c)]. If the standard revision is disapproved by USEPA, the revised standard remains in effect until it is revised by the basin planning process, or USEPA promulgates its own rule which supersedes the standard revision [40 CFR Section 131.21(c)]

THE WATER QUALITY CONTROL PLAN (BASIN PLAN)
FOR THE
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION
FOURTH EDITION
Revised September 2009 (with Approved Amendments)
THE SACRAMENTO RIVER BASIN AND
THE SAN JOAQUIN RIVER BASIN



CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

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APPENDIX

MAPS

or aesthetic enjoyment in conjunction with the above activities.

Commercial and Sport Fishing (COMM) - Uses of water for commercial or recreational collection of fish, shellfish, or other organisms including, but not limited to, uses involving organisms intended for human consumption or bait purposes.

Aquaculture (AQUA) - Uses of water for aquaculture or mariculture operations including, but not limited to, propagation, cultivation, maintenance, or harvesting of aquatic plants and animals for human consumption or bait purposes.

Warm Freshwater Habitat (WARM) - Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

Cold Freshwater Habitat (COLD) - Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

Estuarine Habitat (EST) - Uses of water that support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds).

Wildlife Habitat (WILD) - Uses of water that support terrestrial or wetland ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats or wetlands, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

Preservation of Biological Habitats of Special Significance (BIOL) - Uses of water that support designated areas or habitats, such as established refuges, parks, sanctuaries, ecological reserves, or Areas of Special Biological Significance (ASBS), where the preservation or enhancement of natural resources requires special protection.

Rare, Threatened, or Endangered Species (RARE) - Uses of water that support aquatic habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened or endangered.

Migration of Aquatic Organisms (MIGR) - Uses of water that support habitats necessary for migration or other temporary activities by aquatic organisms, such as anadromous fish.

Spawning, Reproduction, and/or Early Development (SPWN) - Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.

Shellfish Harvesting (SHELL) - Uses of water that support habitats suitable for the collection of filter-feeding shellfish (e.g., clams, oysters, and mussels) for human consumption, commercial, or sports purposes.

Surface Waters

Existing and potential beneficial uses which currently apply to surface waters of the basins are presented in Figure II-1 and Table II-1. The beneficial uses of any specifically identified water body generally apply to its tributary streams, except as provided below:

- MUN, COLD, MIGR and SPWN do not apply to Old Alamo Creek (Solano County) from its headwaters to the confluence with New Alamo Creek
- MUN and the human consumption of aquatic organisms do not apply to Sulphur Creek (Colusa County) from Schoolhouse Canyon to the confluence with Bear Creek

In some cases a beneficial use may not be applicable to the entire body of water. In these cases the Regional Water Board's judgment will be applied.

It should be noted that it is impractical to list every surface water body in the Region. For unidentified water bodies, the beneficial uses will be evaluated on a case-by-case basis.

Water Bodies within the basins that do not have beneficial uses designated in Table II-1 are assigned MUN designations in accordance with the provisions of State Water Board Resolution No. 88-63 which is, by reference, a part of this Basin Plan, except as provided below:

- Old Alamo Creek (Solano County) from its headwaters to the confluence with New Alamo Creek
- Sulphur Creek (Colusa County) from Schoolhouse Canyon to the confluence with Bear Creek

These MUN designations in no way affect the presence or absence of other beneficial use designations in these water bodies.

In making any exemptions to the beneficial use designation of MUN, the Regional Board will apply the exceptions listed in Resolution 88-63 (Appendix Item 8).

Ground Waters

Beneficial uses of ground waters of the basins are presented below. For the purposes of assigning beneficial uses, the term ground water is defined in Chapter I.

Color

Water shall be free of discoloration that causes nuisance or adversely affects beneficial uses.

excluded or where the fishery is not important as a beneficial use.

Dissolved Oxygen

Within the legal boundaries of the Delta, the dissolved oxygen concentration shall not be reduced below:

7.0 mg/l in the Sacramento River (below the I Street Bridge) and in all Delta waters west of the Antioch Bridge; 6.0 mg/l in the San Joaquin River (between Turner Cut and Stockton, 1 September through 30 November); and 5.0 mg/l in all other Delta waters except for those bodies of water which are constructed for special purposes and from which fish have been

For surface water bodies outside the legal boundaries of the Delta, the monthly median of the mean daily dissolved oxygen (*DO*) concentration shall not fall below 85 percent of saturation in the main water mass, and the 95 percentile concentration shall not fall below 75 percent of saturation. The dissolved oxygen concentrations shall not be reduced below the following minimum levels at any time:

Waters designated WARM 5.0 mg/l
Waters designated COLD 7.0 mg/l
Waters designated SPWN 7.0 mg/l

The more stringent objectives in Table III-2 apply to specific water bodies in the Sacramento and San Joaquin River Basins:

**TABLE III-2
SPECIFIC DISSOLVED OXYGEN WATER QUALITY OBJECTIVES**

<u>AMOUNT</u>	<u>TIME</u>	<u>PLACE</u>
9.0 mg/l *	1 June to 31 August	Sacramento River from Keswick Dam to Hamilton City (13)
8.0 mg/l	1 September to 31 May	Feather River from Fish Barrier Dam at Oroville to Honcut Creek (40)
8.0 mg/l	all year	Merced River from Cressy to New Exchequer Dam (78)
8.0 mg/l	15 October to 15 June	Tuolumne River from Waterford to La Grange (86)

* When natural conditions lower dissolved oxygen below this level, the concentrations shall be maintained at or above 95 percent of saturation.

Floating Material

Water shall not contain floating material in amounts that cause nuisance or adversely affect beneficial uses.

affected. During low flow conditions, defined as flows less than 3 cfs, the instantaneous maximum total mercury concentration shall not exceed 1,800 ng/l. During high flow conditions, defined as flows greater than 3 cfs, the instantaneous maximum ratio of mercury to total suspended solids shall not exceed 35 mg/kg. Both objectives apply at the mouth of Sulphur Creek.

Mercury

For Sulphur Creek (Colusa County), waters shall be maintained free of mercury from anthropogenic sources such that beneficial uses are not adversely

Methylmercury

For Clear Lake (53), the methylmercury concentration in fish tissue shall not exceed 0.09 and 0.19 mg methylmercury/kg wet weight of tissue in trophic level 3 and 4 fish, respectively.

For Cache Creek (Clear Lake to Yolo Bypass) (54), North Fork Cache Creek, and Bear Creek (tributary to Cache Creek), the average methylmercury concentration shall not exceed 0.12 and 0.23 mg methylmercury/ kg wet weight of muscle tissue in trophic level 3 and 4 fish, respectively. For Harley Gulch (tributary to Cache Creek), the average methylmercury concentration shall not exceed 0.05 mg methylmercury/ kg wet weight in whole, trophic level 2 and 3 fish.

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Text continued on next page.*

Compliance with the methylmercury fish tissue objectives shall be determined by analysis of fish tissue as described in Chapter V, Surveillance and Monitoring.

Oil and Grease

Waters shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.

pH

The pH shall not be depressed below 6.5 nor raised above 8.5.

The following site-specific objectives replace the general pH objective, above, in its entirety for the listed water bodies.

For Goose Lake (2), pH shall be less than 9.5 and greater than 7.5 at all times.

Pesticides

- No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.
- Discharges shall not result in pesticide concentrations in bottom sediments or aquatic life that adversely affect beneficial uses.
- Total identifiable persistent chlorinated hydrocarbon pesticides shall not be present in the water column at concentrations detectable within the accuracy of analytical methods approved by the Environmental Protection Agency or the Executive Officer.

- Pesticide concentrations shall not exceed those allowable by applicable antidegradation policies (see State Water Resources Control Board Resolution No. 68-16 and 40 C.F.R. Section 131.12.).
- Pesticide concentrations shall not exceed the lowest levels technically and economically achievable.
- Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of pesticides in excess of the Maximum Contaminant Levels set forth in California Code of Regulations, Title 22, Division 4, Chapter 15.
- Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of thiobencarb in excess of 1.0 µg/l.

Pesticide concentrations shall not exceed the levels identified in Table III-2A. Where more than one objective may be applicable, the most stringent objective applies.

For the purposes of this objective, the term pesticide shall include: (1) any substance, or mixture of substances which is intended to be used for defoliating plants, regulating plant growth, or for preventing, destroying, repelling, or mitigating any pest, which may infest or be detrimental to vegetation, man, animals, or households, or be present in any agricultural or nonagricultural environment whatsoever, or (2) any spray adjuvant,

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TABLE III-2A

SPECIFIC PESTICIDE OBJECTIVES

<u>PESTICIDE</u>	<u>MAXIMUM CONCENTRATION AND AVERAGING PERIOD</u>	<u>APPLICABLE WATER BODIES</u>
Chlorpyrifos	0.025 µ g/L ; 1-hour average (acute) 0.015 µ g/L ; 4-day average (chronic) Not to be exceeded more than once in a three year period.	San Joaquin River from Mendota Dam to Vernalis (Reaches include Mendota Dam to Sack Dam (70), Sack Dam to Mouth of Merced River (71), Mouth of Merced River to Vernalis (83)), Delta Waterways listed in Appendix 42. Sacramento River from Shasta Dam to Colusa Basin Drain (13) and the Sacramento River from the Colusa Basin Drain to I Street Bridge (30). Feather River from Fish Barrier Dam to Sacramento River (40).
Diazinon	0.16 µ g/L ; 1-hour average (acute) 0.10 µ g/L ; 4-day average (chronic) Not to be exceeded more than once in a three year period.	San Joaquin River from Mendota Dam to Vernalis (Reaches include Mendota Dam to Sack Dam (70), Sack Dam to Mouth of Merced River (71), Mouth of Merced River to Vernalis (83)), Delta Waterways listed in Appendix 42, Sacramento River from Shasta Dam to Colusa Basin Drain (13) and the Sacramento River from the Colusa Basin Drain to I Street Bridge (30). Feather River from Fish Barrier Dam to Sacramento River (40).

or (3) any breakdown products of these materials that threaten beneficial uses. Note that discharges of "inert" ingredients included in pesticide formulations must comply with all applicable water quality objectives.

Radioactivity

Radionuclides shall not be present in concentrations that are harmful to human, plant, animal or aquatic life nor that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal or aquatic life.

At a minimum, waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of radionuclides in excess of the maximum contaminant levels (MCLs) specified in Table 4 (MCL Radioactivity) of Section 64443 of Title 22 of the California Code of Regulations, which are incorporated by reference into this plan. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect.

Salinity

Electrical Conductivity and Total Dissolved Solids– Special Cases in the Sacramento and San Joaquin River Basins Other Than the Delta

The objectives for electrical conductivity and total dissolved solids in Table III-3 apply to the water bodies specified. To the extent of any conflict with the general Chemical Constituents water quality objectives, the more stringent shall apply.

Electrical Conductivity, Total Dissolved Solids, and Chloride--Delta Waters

The objectives for salinity (electrical conductivity, total dissolved solids, and chloride) which apply to the Delta are listed in Table III-5 at the chapter's end. See Figure III-2 for an explanation of the hydrologic year type classification system. The objectives in Table III-5 were adopted by the State Water Board in May 1991 in the Water Quality Control Plan for Salinity.

organizations to evaluate compliance with this objective.

The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors shall not be less than that for the same water body in areas unaffected by the waste discharge, or, when necessary, for other control water that is consistent with the requirements for "experimental water" as described in *Standard Methods for the Examination of Water and Wastewater*, latest edition. As a minimum, compliance with this objective as stated in the previous sentence shall be evaluated with a 96-hour bioassay.

In addition, effluent limits based upon acute biotoxicity tests of effluents will be prescribed where appropriate; additional numerical receiving water quality objectives for specific toxicants will be established as sufficient data become available; and source control of toxic substances will be encouraged.

Turbidity

Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:

- Where natural turbidity is less than 1 Nephelometric Turbidity Unit (NTU), controllable factors shall not cause downstream turbidity to exceed 2
- Where natural turbidity is between 1 and 5 NTUs, increases shall not exceed 1 NTU.
- Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent.
- Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs.
- Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

In determining compliance with the above limits, appropriate averaging periods may be applied provided that beneficial uses will be fully protected.

Exceptions to the above limits will be considered when a dredging operation can cause an increase in turbidity. In those cases, an allowable zone of dilution within which turbidity in excess of the limits may be tolerated will be defined for the operation and prescribed in a discharge permit.

For Folsom Lake (50) and American River (Folsom Dam to Sacramento River) (51), except for periods of storm runoff, the turbidity shall be less than or equal 10 NTUs. To the extent of any conflict with the general turbidity objective, the more stringent applies.

For Delta waters, the general objectives for turbidity apply subject to the following: except for periods of storm runoff, the turbidity of Delta waters shall not exceed 50 NTUs in the waters of the Central Delta and 150 NTUs in other Delta waters. Exceptions to the Delta specific objectives will be considered when a dredging operation can cause an increase in turbidity. In this case, an allowable zone of dilution within which turbidity in excess of limits can be tolerated will be defined for the operation and prescribed in a discharge permit.

For Deer Creek, source to Cosumnes River:

- When the dilution ratio for discharges is less than 20:1 and where natural turbidity is less than 1 Nephelometric Turbidity Unit (NTU), discharges shall not cause the receiving water daily average turbidity to exceed 2 NTUs or daily maximum turbidity to exceed 5 NTUs. Where natural turbidity is between 1 and 5 NTUs, dischargers shall not cause receiving water daily average turbidity to increase more than 1 NTU or daily maximum turbidity to exceed 5 NTUs
- Where discharge dilution ratio is 20:1 or greater, or where natural turbidity is greater than 5 NTUs, the general turbidity objectives shall apply.

WATER QUALITY OBJECTIVES FOR GROUND WATERS

The following objectives apply to all ground waters of the Sacramento and San Joaquin River Basins, as the objectives are relevant to the protection of designated beneficial uses. These objectives do not require improvement over naturally occurring background concentrations. The ground water objectives contained in this plan are not required by the federal Clean Water Act.

- b. The discharge of agricultural subsurface drainage water to Salt Slough and wetland water supply channels identified in Appendix 40 is prohibited after 10 January 1997, unless water quality objectives for selenium are being met. This prohibition may be reconsidered if public or private interests prevent the implementation of a separate conveyance facility for agricultural subsurface drainage.
- c. The discharge of agricultural subsurface drainage water to Mud Slough (north) and the San Joaquin River from Sack Dam to the mouth of the Merced River is prohibited after 1 October 2010, unless water quality objectives for selenium are being met. This prohibition may be reconsidered if public or private interests prevent the implementation of a separate conveyance facility for agricultural subsurface drainage to the San Joaquin River.
- d. The discharge of selenium from agricultural subsurface drainage systems in the Grassland watershed to the San Joaquin River is prohibited in amounts exceeding 8,000 lbs/year for all water year types beginning 10 January 1997.
- e. Activities that increase the discharge of poor quality agricultural subsurface drainage are prohibited.

7. *Diazinon and Chlorpyrifos Discharges into the Sacramento and Feather Rivers*

Beginning August 11, 2008, the direct or indirect discharge of diazinon or chlorpyrifos into the Sacramento and Feather Rivers is prohibited if, in the previous year (July-June), any exceedance of the diazinon or chlorpyrifos water quality objectives, or diazinon and chlorpyrifos loading capacity occurred.

These prohibitions do not apply if the discharge of diazinon or chlorpyrifos is subject to a waiver of waste discharge requirements implementing the diazinon and chlorpyrifos water quality objectives and load allocations for diazinon and chlorpyrifos for the Sacramento and Feather Rivers, or governed by individual or general waste discharge requirements.

These prohibitions apply only to dischargers causing or contributing to the exceedance of the water quality objective or loading capacity.

8. *Dissolved Oxygen in the Stockton Deep Water Ship Channel(DWSC)*

The discharge of oxygen demanding substances or their precursors into waters tributary to the DWSC portion of the San Joaquin River is prohibited after 31 December 2011 when net daily flow in the DWSC portion of the San Joaquin River in the vicinity of Stockton is less than 3,000 cubic feet per second, unless dissolved oxygen objectives in the DWSC are being met.

Any increase in the discharge of oxygen demanding substances or their precursors into waters tributary to the DWSC portion of the San Joaquin River is prohibited after 23 August 2006.

These prohibitions do not apply if the discharge is regulated by a waiver of waste discharge requirements, or individual or general waste discharge requirements or NPDES permits, which implement the *Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the Stockton Deep Water Ship Channel* or which include a finding that the discharge will have no reasonable potential to cause or contribute to a negative impact on the dissolved oxygen impairment in the DWSC. These prohibitions will be reconsidered by the Regional Water Board by December 2009 based on:

- a) the results of the oxygen demand and precursor studies required in the *Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the Stockton Deep Water Ship Channel*
- b) the prevailing dissolved oxygen conditions in the DWSC

9. *Control of Diazinon and Chlorpyrifos Runoff into the San Joaquin River*

Beginning 1 December 2010, the direct or indirect discharge of diazinon or chlorpyrifos into the San Joaquin River is prohibited during the dormant season (1 December through 1 March) if any exceedance of the chlorpyrifos or diazinon water quality objectives, or diazinon and chlorpyrifos loading capacity occurred during the previous dormant season.

Beginning 2 March 2011, the direct or indirect discharge of diazinon or chlorpyrifos into the

review and control authority. The Board will work with water agencies and others whose activities may influence pesticide levels to minimize concentrations in surface waters.

Since the discharge of pesticides into surface waters will be allowed under certain conditions, the Board will take steps to ensure that this control program is conducted in compliance with the federal and state antidegradation policies. This will primarily be done as pesticide discharges are evaluated on a case by case basis.

Diazinon and Chlorpyrifos Runoff into the Sacramento and Feather Rivers

1. The Sacramento and Feather River pesticide runoff control program shall:
 - a. ensure compliance with water quality objectives applicable to diazinon and chlorpyrifos water quality objectives in the Sacramento and Feather Rivers through the implementation of management practices;
 - b. ensure that measures that are implemented to reduce discharges of diazinon and chlorpyrifos do not lead to an increase in the discharge of other pesticides to levels that cause or contribute to violations of applicable water quality objectives and Regional and State Water Board policies; and
 - c. ensure that discharges of pesticides to surface waters are controlled so that the pesticide concentrations are at the lowest levels that are technically and economically achievable.
2. Dischargers must consider whether a proposed alternative to diazinon or chlorpyrifos has the potential to degrade ground or surface water. If the alternative to diazinon or chlorpyrifos has the potential to degrade ground water, alternative pest control methods must be considered. If the alternative to diazinon or chlorpyrifos has the potential to degrade surface water, control measures must be implemented to ensure that applicable water quality objectives and Regional Water and State Board policies are not violated, including State Water Resources Control Board Resolution 68-16.
3. Compliance with water quality objectives, waste load allocations, and load allocations for diazinon and chlorpyrifos in the Sacramento and Feather Rivers is required by August 11, 2008.

The water quality objectives and allocations will be implemented through the adoption or modification of waivers of waste discharge requirements, and general or individual waste discharge requirements where provisions necessary for implementation are not already in place.

4. The Regional Water Board will review the diazinon and chlorpyrifos allocations and the implementation provisions in the Basin Plan no later than 30 June 2013.
5. Regional Water Board staff will meet at least annually with staff from the Department of Pesticide Regulation and representatives from the California Agricultural Commissioners and Sealers Association to review pesticide use and instream pesticide concentrations during the dormant spray and irrigation application season and to consider the effectiveness of management measures in meeting water quality objectives and load allocations.
6. The Waste Load Allocations (WLA) for all NPDES-permitted dischargers, Load Allocations (LA) for nonpoint source discharges, and the Loading Capacity of the Sacramento and Feather Rivers shall not exceed the sum (S) of one (1) as defined below.

$$S = \frac{C_D}{WQO_D} + \frac{C_C}{WQO_C} \leq 1.0$$

where

C_D = diazinon concentration in $\mu\text{g/L}$ of point source discharge for the WLA; nonpoint source discharge for the LA; or the Sacramento or Feather Rivers for the LC.

C_C = chlorpyrifos concentration in $\mu\text{g/L}$ of point source discharge for the WLA; nonpoint source discharge for the LA; or the Sacramento or Feather Rivers for the LC.

WQO_D = acute or chronic diazinon water quality objective in $\mu\text{g/L}$.

WQO_C = acute or chronic chlorpyrifos water quality objective in $\mu\text{g/L}$.

Available samples collected within the applicable averaging period for the water quality objective will be used to determine compliance with the allocations and loading capacity. Prior to performing any averaging calculations, only chlorpyrifos and diazinon results from the same sample will be used in calculating the sum (S).

For purposes of calculating the sum (S) above, analytical results that are reported as “nondetectable” concentrations are considered to be zero.

Compliance with the load allocations will be determined where the nonpoint source discharges into the Sacramento or Feather Rivers.

7. The established waste load and load allocations for diazinon and chlorpyrifos and the water quality objectives for diazinon and chlorpyrifos in the Sacramento and Feather Rivers represent a maximum allowable level. The Regional Water Board shall require any additional reductions in diazinon or chlorpyrifos levels necessary to account for additive or synergistic toxicity effects or to protect beneficial uses in tributary waters.
8. Pursuant to CWC §13267, the Executive Officer will require dischargers to submit a management plan that describes the actions that the discharger will take to reduce diazinon and chlorpyrifos discharges and meet the applicable allocations.

The management plan may include actions required by State and federal pesticide regulations. The Executive Officer will require the discharger to document the relationship between the actions to be taken and the expected reductions in diazinon and chlorpyrifos discharge(s). The Executive Officer will allow individual dischargers or a discharger group or coalition to submit management plans.

The management plan must comply with the provisions of any applicable waiver of waste discharge requirements or waste discharge requirements. The Executive Officer may require revisions to the management plan if compliance with applicable allocations is not attained or the management plan is not reasonably likely to attain compliance. When requiring any revisions to the management plan, the Executive Officer may consider the relative contributions of diazinon and chlorpyrifos to the lack of compliance with the allocations.

9. Any waiver of waste discharge requirements or waste discharge requirements that govern the control of pesticide runoff that is discharged directly or indirectly into the Sacramento or Feather Rivers must be consistent with the policies and actions described in paragraphs 1-8.
10. In determining compliance with the waste load allocations, the Regional Water Board will consider any data or information submitted by the discharger regarding diazinon and chlorpyrifos inputs from sources outside of the jurisdiction of the permitted discharge, including any diazinon and chlorpyrifos present in precipitation; and any applicable provisions in the discharger’s NPDES permit requiring the discharger to reduce the discharge of pollutants to the maximum extent practicable.
11. The above provisions for control of diazinon and chlorpyrifos discharges apply to the Sacramento and Feather Rivers as described in Table III-2A.

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Diazinon and Chlorpyrifos Runoff in the San Joaquin River Basin

1. The pesticide runoff control program shall:
 - a. Ensure compliance with water quality objectives applicable to diazinon and chlorpyrifos in the San Joaquin River through the implementation of management practices.
 - b. Ensure that measures that are implemented to reduce discharges of diazinon and chlorpyrifos do not lead to an increase in the discharge of other pesticides to levels that cause or contribute to violations of applicable water quality objectives and Regional Water Board policies; and
 - c. Ensure that discharges of pesticides to surface waters are controlled so that pesticide concentrations are at the lowest levels that are technically and economically achievable.
2. Dischargers must consider whether a proposed alternative to diazinon or chlorpyrifos has the potential to degrade ground or surface water. If the alternative has the potential to degrade groundwater, alternative pest control methods must be considered. If the alternative has the potential to degrade surface water, control measures must be implemented to ensure that applicable water quality objectives and Regional Water Board policies are not violated, including State Water Resources Control Board Resolution 68-16.
3. Compliance with applicable water quality objectives, load allocations, and waste load allocations for diazinon and chlorpyrifos in the San Joaquin River is required by 1 December 2010.

The water quality objectives and allocations will be implemented through one or a combination of the following: the adoption of one or more waivers of waste discharge requirements, and general or individual waste discharge requirements. To the extent not already in place, the Regional Water Board expects to adopt or revise the appropriate waiver(s) or waste discharge requirements by 31 December 2007.

4. The Regional Water Board intends to review the diazinon and chlorpyrifos allocations and the implementation provisions in the Basin Plan at least once every five years, beginning no later than 31 December 2009.

5. Regional Water Board staff will meet at least annually with staff from the Department of Pesticide Regulation and representatives from the California Agricultural Commissioners and Sealers Association to review pesticide use and instream pesticide concentrations during the dormant spray and irrigation application seasons, and to consider the effectiveness of management measures in meeting water quality objectives and load allocations.
6. The Waste Load Allocations (WLA) for all NPDES-permitted dischargers, Load Allocations (LA) for nonpoint source discharges, and the Loading Capacity of the San Joaquin River from the Mendota Dam to Vernalis shall not exceed the sum (S) of one (1) as defined below.

$$S = \frac{C_D}{WQO_D} + \frac{C_C}{WQO_C} \leq 1.0$$

where

CD = diazinon concentration in µg/L of point source discharge for the WLA; nonpoint source discharge for the LA; or San Joaquin River for the LC.

CC = chlorpyrifos concentration in µg/L of point source discharge for the WLA; nonpoint source discharge for the LA; or San Joaquin River for the LC.

WQOD = acute or chronic diazinon water quality objective in µg/L.

WQOC = acute or chronic chlorpyrifos water quality objective in µg/L.

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ESTIMATED COSTS OF AGRICULTURAL WATER QUALITY CONTROL PROGRAMS AND POTENTIAL SOURCES OF FINANCING

San Joaquin River Subsurface Agricultural Drainage Control Program

The estimates of capital and operational costs to achieve the selenium objective for the San Joaquin River range from \$3.6 million/year to \$27.4 million/year (1990 dollars). The cost of meeting water quality objectives in Mud Slough (north), Salt Slough, and the wetland supply channels is approximately \$2.7 million /year (1990 dollars).

Potential funding sources include:

1. Private financing by individual sources.
2. Bonded indebtedness or loans from governmental institutions.
3. Surcharge on water deliveries to lands contributing to the drainage problem.
4. Ad Valorem tax on lands contributing to the drainage problem.
5. Taxes and fees levied by a district created for the purpose of drainage management.
6. State or federal grants or low-interest loan programs.
7. Single-purpose appropriations from federal or State legislative bodies (including land retirement programs).

Lower San Joaquin River Salt and Boron Control Program

The estimates of capital and operational costs to implement drainage controls needed to achieve the salt and boron water quality objectives at the Airport Way Bridge near Vernalis range from 27 to 38 million dollars per year (2003 dollars).

Potential funding sources include:

1. Those identified in the San Joaquin River Subsurface Agricultural Drainage Program and the Pesticide Control Program.
2. Annual fees for waste discharge requirements.

Pesticide Control Program

Based on an average of \$15 per acre per year for 500,000 acres of land planted to rice and an average of \$5 per acre per year for the remaining 3,500,000 acres of irrigated agriculture in the Sacramento and San Joaquin River Basins, the total annual cost to agriculture is estimated at \$25,000,000. Financial assistance for complying with this program may be obtainable through the U.S.D.A. Agricultural Stabilization and Conservation Service and technical assistance is available from the University of California Cooperative Extension Service and the U.S.D.A. Soil Conservation Service.

Sacramento and Feather Rivers Diazinon and Chlorpyrifos Runoff Control Program

The total estimated costs for management practices to meet the diazinon and chlorpyrifos objectives for the Sacramento and Feather Rivers range from \$0 to \$6.2 million/year (2007 dollars). The estimated costs for discharger monitoring, planning, and evaluation range from \$0.3 to \$1.5 million/year (2007 dollars).

Potential funding sources include:

1. Those identified in the San Joaquin River Subsurface Agricultural Drainage Control Program and the Pesticide Control Program.

San Joaquin River Dissolved Oxygen Control Program

The Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the Stockton Deep Water Ship Channel (DWSC) requires agricultural and municipal dischargers to perform various studies. The total estimated cost of the studies to be performed as part of this control program is approximately \$15.6 million. The preferred alternative also includes a prohibition of discharge if water quality objectives are not achieved by 31 December 2011. The estimated cost to cease discharge of water from irrigated lands ranges from \$95 to \$133 million per year. The estimated cost to provide minimum flows that would remove the need

Average concentrations of methylmercury by trophic level should be determined in a combination of the identified species collected throughout Clear Lake.

Total mercury in tributary sediment, lake sediment, and water will be monitored to determine whether loads have decreased. The water and sediment monitoring frequency will be every five years.

Cache Creek, Bear Creek, Harley Gulch, and Sulphur Creek

The Regional Water Board will use the following criteria to determine compliance with the methylmercury fish tissue objectives in Cache and Bear Creeks. Compliance with the respective objectives shall be determined based on fish tissue analysis in Cache Creek from Clear Lake to the Settling Basin, North Fork Cache Creek, and Bear Creek upstream and downstream of Sulphur Creek.

The representative fish species for each trophic level shall be:

- Trophic Level 3: green sunfish, bluegill, and/or Sacramento sucker (rainbow trout also an option for North Fork Cache Creek);
- Trophic Level 4: Sacramento pikeminnow, largemouth bass, smallmouth bass and/or channel catfish.

The sample sets will include at least two species from each trophic level (i.e., bass and Sacramento pikeminnow, for TL4) collected at each compliance point or stream section. The samples will include a range of sizes of fish between 250 and 350 mm, total length, with average length of 300 mm. If green sunfish and bluegill are not available in this size range; those sampled should be greater than 125 mm total length. If two species per trophic level are not available and are unlikely to be present given historical sampling information, one species is acceptable (the only TL4 species typically in North Fork is Sacramento pikeminnow).

Compliance with the Harley Gulch methylmercury water quality objective will be determined using hardhead, California roach, or other small (TL2/3), resident species in the size range of 75-100 mm total length.

Aqueous methylmercury goals are in the form of the annual, average concentration in unfiltered samples. For comparison of methylmercury concentration data with aqueous methylmercury goals, water samples are recommended to be collected periodically throughout the year and during typical flow conditions as they vary by season, rather than targeting extreme low or high flow events. Aqueous

methylmercury data may be collected by Regional Water Board staff or required of project proponents.

Monitoring for mine cleanups or other projects that are expected to significantly affect methylmercury or mercury loads are recommended to include the following parameters. The data may be collected by Regional Water Board staff or required of project proponents.

- Monitoring parameters for soil and sediment: concentration of total mercury in soil or sediment in the silt/clay (<63 microns) fraction.
- Monitoring parameters for water: methylmercury (if project is methylmercury source), total mercury, total suspended solids, turbidity, and stream flow. Water sampling in major tributaries is recommended to include high flow events for mercury and total suspended solids. More frequent monitoring (two to four significant storm events for three consecutive years) is recommended after cleanup to evaluate the effectiveness of cleanup actions.
- Monitoring of mercury in suspended sediment: The ratio of concentrations of mercury in suspended sediment (Hg/TSS) is a useful measure of mercury contamination. Effectiveness of cleanup of the mines may be assessed by comparing concentration of mercury in fine-grained sediment discharging from the mines to the average concentration in background (not affected by mining activities) soil or sediment.

Diazinon and Chlorpyrifos Runoff into the Sacramento and Feather Rivers

The Regional Water Board requires a focused monitoring effort of agricultural pesticide runoff into the Sacramento and Feather Rivers.

The monitoring and reporting program for any waste discharge requirements or waiver of waste discharge requirements that addresses agricultural pesticide runoff into the Sacramento and Feather Rivers must be designed to collect the information necessary to:

1. determine compliance with established water quality objectives and the loading capacity applicable to diazinon and chlorpyrifos in the Sacramento and Feather Rivers;
2. determine compliance with load allocations for diazinon and chlorpyrifos;

3. determine the degree of implementation of management practices to reduce off-site migration of diazinon and chlorpyrifos;
4. determine the effectiveness of management practices and strategies to reduce off-site migration of diazinon and chlorpyrifos;
5. determine whether alternatives to diazinon or chlorpyrifos are causing surface water quality impacts;
6. determine whether the discharge causes or contributes to a toxicity impairment due to additive or synergistic effects of multiple pollutants; and
7. demonstrate that management practices are achieving the lowest pesticide levels technically and economically achievable.

Dischargers are responsible for providing the necessary information. The information may come from the dischargers' monitoring efforts; monitoring programs conducted by State or federal agencies or collaborative watershed efforts; or from special studies that evaluate the effectiveness of management practices.

Diazinon and Chlorpyrifos Runoff in the San Joaquin River Basin

The Regional Water Board requires a focused monitoring effort of pesticide runoff from orchards and fields in the San Joaquin Valley.

The monitoring and reporting program for any waste discharge requirements or waiver of waste discharge requirements that addresses pesticide runoff from orchards and fields in the San Joaquin valley must be designed to collect the information necessary to:

1. determine compliance with established water quality objectives and the loading capacity applicable to diazinon and chlorpyrifos in the San Joaquin River;
2. determine compliance with established load allocations for diazinon and chlorpyrifos;
3. determine the degree of implementation of management practices to reduce off-site movement of diazinon and chlorpyrifos;
4. determine the effectiveness of management practices and strategies to reduce off-site migration of diazinon and chlorpyrifos;

5. determine whether alternatives to diazinon and chlorpyrifos are causing surface water quality impacts;
6. determine whether the discharge causes or contributes to a toxicity impairment due to additive or synergistic effects of multiple pollutants; and
7. demonstrate that management practices are achieving the lowest pesticide levels technically and economically achievable.

Dischargers are responsible for providing the necessary information. The information may come from the dischargers' monitoring efforts; monitoring programs conducted by State or federal agencies or collaborative watershed efforts; or from special studies that evaluate the effectiveness of management practices.

Diazinon and Chlorpyrifos Runoff into the Sacramento-San Joaquin Delta Waterways

The Regional Water Board requires a focused monitoring effort of pesticide runoff from orchards and fields discharging to the Sacramento-San Joaquin Delta Waterways (as identified in Appendix 42).

The monitoring and reporting program for any waste discharge requirements or waiver of waste discharge requirements that addresses pesticide runoff into the Delta Waterways must be designed to collect the information necessary to:

1. Determine compliance with established water quality objectives and loading capacity, applicable to diazinon and chlorpyrifos in the Delta Waterways.
2. Determine compliance with the load allocations applicable to discharges of diazinon and chlorpyrifos into the Delta Waterways.
3. Determine the degree of implementation of management practices to reduce off-site movement of diazinon and chlorpyrifos.
4. Determine the effectiveness of management practices and strategies to reduce off-site migration of diazinon and chlorpyrifos.
5. Determine whether alternatives to diazinon and chlorpyrifos are causing surface water quality impacts.