

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

* 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)]

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Subject	Date Adopted By Reg. Bd.	Regional Board Resolution No.	Date in Effect
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
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

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18. Non-Regulatory Amendments to Correct Editing Errors and Update Language	8/13/09	R5-2009-0069	5/18/11
19. Amendments to Control Methylmercury And Total Mercury in the Sacramento-San Joaquin Delta Estuary	4/22/2010	R5-2010-0043	10/20/11

THE WATER QUALITY CONTROL PLAN (BASIN PLAN)
FOR THE
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION
FOURTH EDITION
Revised October 2011 (with Approved Amendments)
THE SACRAMENTO RIVER BASIN AND
THE SAN JOAQUIN RIVER BASIN



CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

Katherine Hart, Chair
Lyle Hoag, Member
Karl Longley, Member
Sandra Meraz, Member
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COVER PHOTO ACKNOWLEDGMENTS:

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Sugar Beets: Brenda Grewell/ Dept. of Water Resources

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APPENDIX

MAPS

SURFACE WATER BODIES AND BENEFICIAL USES

	SURFACE WATER BODIES (1)	HYDRO UNIT NUMBER	AGRI-CULTURE		INDUSTRY			RECREATION		FRESHWATER HABITAT (2)		MIGRATION		SPAWNING		WILD	NAV
			MUN	AGR	PROC	IND	POW	REC-1	REC-2	WARM	COLD	MIGR	SPWN				
			MUNICIPAL AND DOMESTIC SUPPLY	IRRIGATION	STOCK WATERING	PROCESS	SERVICE SUPPLY	POWER	CONTACT	CANOEING (1) AND RAFTING	OTHER NONCONTACT	WARM	COLD	WARM (3)	COLD (4)		
30	COLUSA BASIN DRAIN TO EYE ["I"] STREET BRIDGE	520.00	E	E				E	E	E	E	E	E	E	E	E	E
31	SUTTER BYPASS	520.3	E	E				E	E	E	E	E	E	E	E	E	E
32	FEATHER RIVER LAKE ALMANOR	518.41					E	E						E		E	
33	NORTH FORK, FEATHER RIVER	518.4	E				E	E	E	E				E	E		
34	MIDDLE FORK, FEATHER RIVER	518.3															
35	SOURCE TO LITTLE LAST CHANCE CREEK	518.35		E	E			E	E	E	E			E	E	E	
35	FRENCHMAN RESERVOIR	518.36						E	E	E	P	E		E	E	E	
36	LITTLE LAST CHANCE CREEK TO LAKE OROVILLE	518.3	E					E	E	E	E				E	E	
37	LAKE DAVIS	518.34						E	E	E	P	E		E	E	E	
38	LAKES BASIN LAKES	518.5						E	E	E	E			E	E	E	
39	LAKE OROVILLE	518.12	E	E				E	E	E	E			E	E	E	
40	FISH BARRIER DAM TO SACRAMENTO RIVER	515.	E	E				E	E	E	E	E	E	E	E	E	
41	YUBA RIVER																
42	SOURCES TO ENGLEBRIGHT RESERVOIR	517.	E	E	E			E	E	E	E	E	E	E	E	E	
42	ENGLEBRIGHT DAM TO FEATHER RIVER	515.3		E	E			E	E	E	E	E	E	E	E	E	
43	BEAR RIVER	515.1	E	E	E			E	E	E	E	E	P	P	P	P	E
44	AMERICAN RIVER																
45	NORTH FORK, SOURCE TO FOLSOM LAKE	514.5	E	E				E	E	E	P	E			E	E	
45	MIDDLE FORK, SOURCE TO FOLSOM LAKE	514.4	E	E	E			E	E	E	P	E			E	E	
46	DESOLATION VALLEY LAKES	514.4						E		E					E	E	
47	SOUTH FORK	514.3															
48	SOURCE TO PLACERVILLE	514.3	E					E	E	E	P	E			E	E	
49	PLACERVILLE TO FOLSOM LAKE	514.32	E	E				E	E	E	E	E				E	
50	FOLSOM LAKE	514.23	E	E		P		E	E	E	E	E			E	E	
51	FOLSOM DAM TO SACRAMENTO RIVER	519.21	E	E		E		E	E	E	E	E	E	E	E	E	
52	YOLO BYPASS (8)	510.		E	E			E	E	E	E	P	E	E	E	E	
53	CACHE CREEK																
54	CLEAR LAKE (a)	513.52	E	E	E			E		E	E	P			E		E
54	CLEAR LAKE TO YOLO BYPASS (d)	511/513	E	E	E	E	E	E	E	E	E	P			E	E	E

(1) Shown for streams and rivers only with the implication that certain flows are required for this beneficial use.
 (2) Resident does not include anadromous. Any Segments with both COLD and WARM beneficial use designations will be considered COLD water bodies for the application of water quality objectives.
 (3) Striped bass, sturgeon, and shad.
 (4) Salmon and steelhead
 (5) As a primary beneficial use.

(a) The following beneficial uses EXIST in addition to those noted in Table II-1

Mud Slough (north): COMM and SHELL
 Salt Slough: COMM, BIOL, and SHELL
 Wetland Water Supply Channels: BIOL
 Clear Lake: COMM

(6) The indicated beneficial uses are to be protected for all waters except in specific cases where evidence indicates the appropriateness of additional or alternative beneficial use designations.
 (7) Sport fishing is the only recreation activity permitted.
 (8) Beneficial uses vary throughout the Delta and will be evaluated on a case-by-case basis. COMM is a designated beneficial use for the Sacramento San Joaquin Delta and Yolo Bypass waterways listed in Appendix 43 and not any tributaries to the listed waterways or portions of the listed waterways outside of the legal Delta boundary unless specifically designated.

(d) In addition to the beneficial uses noted in Table II-1, COMM exists for Cache Creek from Clear Lake to Yolo Bypass and in the following tributaries only: North Fork Cache Creek and Bear Creek.

(9) Per State Water Board Resolution No. 90-28, Marsh Creek and Marsh Creek Reservoir in Contra Costa County are assigned the following beneficial uses: REC1 and REC2 (potential uses), WARM, WILD and RARE. COMM is a designated beneficial use for Marsh Creek and its tributaries listed in Appendix 43 within the legal Delta boundary.

A/ Hidden Reservoir = Hensley Lake
 B/ Buchanan Reservoir = Eastman Lake

TABLE II-1 (cont'd)

SURFACE WATER BODIES AND BENEFICIAL USES

	SURFACE WATER BODIES (1)	HYDRO UNIT NUMBER	MUN	AGRI-CULTURE		INDUSTRY			RECREATION			FRESHWATER HABITAT (2)		MIGRATION	SPAWNING		WILD	NAV
				AGR	PROC	IND	POW	REC-1	REC-2	WARM	COLD	MIGR	SPWN					
														IRRIGATION	STOCK WATERING	PROCESS		
55	PUTAH CREEK	512.21	E	E	E			P	E		E	E	E			E	E	
56	LAKE BERRYESSA	510/511	E	E	E				E	E	E	P	E			E	E	
	LAKE BERRYESSA TO YOLO BYPASS		E	E	E				E	E	E	E	E			E	E	
	OTHER LAKES AND RESERVOIRS IN SACRAMENTO R. BASIN 5A (6)		E	E	E	E		E	E	E	E	E	E			E	E	
	COSUMNES RIVER																	
57	SOURCES TO NASHVILLE RESERVOIR (PROPOSED)	532.	E	E					E		E		E			E	E	
58	NASHVILLE RESERVOIR (PROPOSED)	532.	P					P	P		P	P	P		P	P	P	
59	SOURCE TO DELTA	531/532	E	E	E				E	E	E	E	E	E	E	E	E	
	MOKELUMNE RIVER																	
60	SOURCES TO PARDEE RESERVOIR	532.6	E					E	E	E	E	E	E		E	E	E	
61	PARDEE RESERVOIR (7)	532.6	E					E	E	E	E	E	E		E	E	E	
62	CAMANCHE RESERVOIR	531.2	E	E	E				E	E	E	E	E	E	E	E	E	
63	CAMANCHE RESERVOIR TO DELTA	531.2		E	E				E	E	E	E	E	E	E	E	E	
	CALAVERAS RIVER																	
64	SOURCE TO NEW HOGAN RESERVOIR	533.							E	E	E	E	E	E	E	E	E	
65	NEW HOGAN RESERVOIR	533.1							E	E	E	E	E	E	E	E	E	
66	NEW HOGAN RESERVOIR TO DELTA	531.3	E	E	E	P	P		E	E	E	E	E	E	E	E	E	
	OTHER LAKES AND RESERVOIRS IN HYDRO UNIT NOS. 531, 532, 533, 543, 544 (6)		E	E	E	E			E		E	E	E			E	E	
	SAN JOAQUIN RIVER																	
67	SOURCES TO MILLERTON LAKE	540.	E	E	E			E	E	E	E	E	E					E
68	MILLERTON LAKE	540.12	P	E	E				E		E	E	P					E
69	FRIANT DAM TO MENDOTA POOL	545.	E	E	E	E			E	E	E	E	E	E	E	P	E	
70	MENDOTA DAM TO SACK DAM	545.1	P	E	E	E			E	E	E	E	E	E	E	P	E	
71	SACK DAM TO MOUTH OF MERCED RIVER	535.7	P	E	E	E			E	E	E	E	E	E	E	P	E	
	FRESNO RIVER																	
72	SOURCE TO HIDDEN RESERVOIR A/	539.31	E	E	E				E		E	E	E					E
73	HIDDEN RESERVOIR A/	539.32	E	E	E				E		E	E	E					E
74	HIDDEN RESERVOIR TO SAN JOAQUIN RIVER	545.	P	E	E				E	P	E	E	E					E
	CHOWCHILLA RIVER																	
75	SOURCE TO BUCHANAN RESERVOIR B/	539.11							E		E	E	E					E
76	BUCHANAN RESERVOIR B/	539.12	E	E	E				E		E	E	E					E
77	BUCHANAN DAM TO SAN JOAQUIN RIVER	535/545	P	E		E			E	P	E	E	E					E

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 (2) Resident does not include anadromous. Any Segments with both COLD and WARM beneficial use designations will be considered COLD water bodies for the application of water quality objectives.
 (3) Striped bass, sturgeon, and shad.
 (4) Salmon and steelhead
 (5) As a primary beneficial use.

(6) The indicated beneficial uses are to be protected for all waters except in specific cases where evidence indicates the appropriateness of additional or alternative beneficial use designations.
 (7) Sport fishing is the only recreation activity permitted.
 (8) Beneficial uses vary throughout the Delta and will be evaluated on a case-by-case basis. COMM is a designated beneficial use for the Sacramento San Joaquin Delta and Yolo Bypass waterways listed in Appendix 43 and not any tributaries to the listed waterways or portions of the listed waterways outside of the legal Delta boundary unless specifically designated.

(9) Per State Water Board Resolution No. 90-28, Marsh Creek and Marsh Creek Reservoir in Contra Costa County are assigned the following beneficial uses: REC1 and REC2 (potential uses), WARM, WILD and RARE. COMM is a designated beneficial use for Marsh Creek and its tributaries listed in Appendix 43 within the legal Delta boundary.
 A/ Hidden Reservoir = Hensley Lake
 B/ Buchanan Reservoir = Eastman Lake

TABLE II-1 (cont'd)

SURFACE WATER BODIES AND BENEFICIAL USES

	SURFACE WATER BODIES (1)	HYDRO UNIT NUMBER	MUN	AGRI-CULTURE		INDUSTRY			RECREATION			FRESHWATER HABITAT (2)		MIGRATION	SPAWNING		WILD	NAV
				AGR	STOCK WATERING	PROC	IND	POW	REC-1	REC-2	WARM	COLD	MIGR	SPWN				
															IRRIGATION	PROCESS		
78	MERCED RIVER	537.	P	E				E	E	E	E	E	E				E	
79	SOURCE TO McCLURE LAKE	537.22	P	E				E	E	E	E	E	E				E	
80	McCLURE LAKE	537.1	P	E				E	E	E	E	E	E				E	
81	McSWAIN RESERVOIR																	
82	McSWAIN RESERVOIR TO SAN JOAQUIN RIVER	535.	E		E	E	E	E	E	E	E	E	E	E	E	E	E	
83	YOSEMITE LAKE	535.9															E	
83	MOUTH OF MERCED RIVER TO VERNALIS TUOLUMNE RIVER	535/541	P	E	E	E			E	E	E	E	E	E	E	E	E	
84	SOURCE TO [NEW] DON PEDRO RESERVOIR	536.	E	E	E				E	E	E	E	E				E	
85	NEW DON PEDRO RESERVOIR	536.32	P						E	E	E	E	E				E	
86	NEW DON PEDRO DAM TO SAN JOAQUIN RIVER	535.	P	E	E				E	E	E	E	E	E	E	E	E	
86	STANISLAUS RIVER																	
87	SOURCE TO NEW MELONES RESERVOIR (PROPOSED)	534.	E	E	E				E	E	E	E	E				E	
88	NEW MELONES RESERVOIR	534.21	E	E	E				E	E	E	E	E				E	
89	TULLOCH RESERVOIR	534.22	P	E	E				E	E	E	E	E				E	
90	GOODWIN DAM TO SAN JOAQUIN RIVER	535.	P	E	E	E	E	E	E	E	E	E	E	E	E	E	E	
91	SAN LUIS RESERVOIR	542.32	E	E	E		E	E	E	E	E	E	E				E	
92	O'NEILL RESERVOIR	541.2	E	E	E				E	E	E	E	E				E	
93	OTHER LAKES AND RESERVOIRS IN SAN JOAQUIN R. BASIN, (EXCLUDING HYDRO UNIT NOS. 531-533, 543, 544) (6)		E						E	E	E	E	E			E	E	
94	CALIFORNIA AQUEDUCT	541.	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	
95	DELTA-MENDOTA CANAL	541/543	E	E	E				E		E	E	E				E	
	GRASSLAND WATERSHED [a]	541.2																
96	MUD SLOUGH (NORTH)			L (b)	E				E		E	E	E		E		E	
97	SALT SLOUGH			E	E				E		E	E	E		E		E	
98	WETLAND WATER SUPPLY CHANNELS (10)			L (b)	E												E	
C	SACRAMENTO SAN JOAQUIN DELTA (8, 9)	544.	E	E	E	E	E	E	E	E	E	L (c)	E	E	E	E	E	E

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 (4) Salmon and steelhead
 (5) As a primary beneficial use.
 (a) The following beneficial uses EXIST in addition to those noted in Table II-1
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(9) Per State Water Board Resolution No. 90-28, Marsh Creek and Marsh Creek Reservoir in Contra Costa County are assigned the following beneficial uses: REC1 and REC2 (potential uses), WARM, WILD and RARE. COMM is a designated beneficial use for Marsh Creek and its tributaries listed in Appendix 43 within the legal Delta boundary.
 (10) Wetland water supply channels for which beneficial uses are designated are defined in Appendix 40

(b) Elevated natural salt and boron concentrations may limit this use to irrigation of salt and boron tolerant crops. Intermittent low flow conditions may also limit this use.
 (c) Wetland channels can sustain aquatic life, but due to fluctuating flow regimes and habitat limitations, may not be suitable for nesting and/or propagation.

Bacteria

In waters designated for contact recreation (REC-1), the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200/100 ml, nor shall more than ten percent of the total number of samples taken during any 30-day period exceed 400/100 ml.

For Folsom Lake (50), the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period, shall not exceed a geometric mean of 100/100 ml, nor shall more than ten percent of the total number of samples taken during any 30-day period exceed 200/100 ml.

Biostimulatory Substances

Water shall not contain biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses.

Chemical Constituents

Waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. The chemical constituent objectives in Table III-1 apply to the water bodies specified. Metal objectives in the table are dissolved concentrations. Selenium,

molybdenum, and boron objectives are total concentrations. Water quality objectives are also contained in the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta, adopted by the State Water Board in May 1995 and revised in 2006.

At a minimum, water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs) specified in the following provisions of Title 22 of the California Code of Regulations, which are incorporated by reference into this plan: Tables 64431-A (Inorganic Chemicals) and 64431-B (Fluoride) of Section 64431, Table 64444-A (Organic Chemicals) of Section 64444, and Tables 64449-A (Secondary Maximum Contaminant Levels-Consumer Acceptance Limits) and 64449-B (Secondary Maximum Contaminant Levels-Ranges) of Section 64449. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect. At a minimum, water designated for use as domestic or municipal supply (MUN) shall not contain lead in excess of 0.015 mg/l. The Regional Water Board acknowledges that specific treatment requirements are imposed by state and federal drinking water regulations on the consumption of surface waters under specific circumstances. To protect all beneficial uses the Regional Water Board may apply limits more stringent than MCLs.

TABLE III-1
TRACE ELEMENT WATER QUALITY OBJECTIVES

<u>CONSTITUENT</u>	<u>MAXIMUM CONCENTRATION</u> ^a <u>(mg/l)</u>	<u>APPLICABLE WATER BODIES</u>
Arsenic	0.01	Sacramento River from Keswick Dam to the I Street Bridge at City of Sacramento (13, 30); American River from Folsom Dam to the Sacramento River (51); Folsom Lake (50); and the Sacramento-San Joaquin Delta.
Barium	0.1	As noted above for Arsenic.
Boron	2.0 (15 March through 15 September)	San Joaquin River, mouth of the Merced River to Vernalis
	0.8 (monthly mean, 15 March through 15 September)	
	2.6 (16 September through 14 March)	
	1.0 (monthly mean, 16 September through 14 March)	
	1.3 (monthly mean, critical year ^b)	Salt Slough, Mud Slough (north), San Joaquin River from Sack Dam to the mouth of Merced River
	5.8	
	2.0 (monthly mean, 15 March through 15 September)	
Cadmium	0.00022 ^c	Sacramento River and its tributaries above State Hwy 32 bridge at Hamilton City

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.

For the Sacramento-San Joaquin Delta and Yolo Bypass waterways listed in Appendix 43, the average methylmercury concentrations shall not exceed 0.08 and 0.24 mg methylmercury/kg, wet weight, in muscle tissue of trophic level 3 and 4 fish, respectively (150-500 mm total length). The average methylmercury concentrations shall not exceed 0.03 mg methylmercury/kg, wet weight, in whole fish less than 50 mm in length.

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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 64442 of Section 64442 and Table 64443 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

See the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, 2006, for salinity objectives applicable in the Delta.

Temperature

The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses.

Temperature objectives for COLD interstate waters, WARM interstate waters, and Enclosed Bays and Estuaries are as specified in the *Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays of California* including any revisions. There are also temperature objectives for the Delta in the State Water Board's *2006 Water Quality Control Plan for*

the San Francisco Bay/Sacramento-San Joaquin Delta Estuary.

At no time or place shall the temperature of COLD or WARM intrastate waters be increased more than 5°F above natural receiving water temperature. Temperature changes due to controllable factors shall be limited for the water bodies specified as described in Table III-4. To the extent of any conflict with the above, the more stringent objective applies.

In determining compliance with the water quality objectives for temperature, appropriate averaging periods may be applied provided that beneficial uses will be fully protected.

TABLE III-4
SPECIFIC TEMPERATURE OBJECTIVES

DATES

From 1 December to 15 March, the maximum temperature shall be 55°F.

From 16 March to 15 April, the maximum temperature shall be 60°F.

From 16 April to 15 May, the maximum temperature shall be 65°F.

From 16 May to 15 October, the maximum temperature shall be 70°F.

From 16 October to 15 November, the maximum temperature shall be 65°F.

From 16 November to 30 November, the maximum temperature shall be 60°F.

The temperature in the epilimnion shall be less than or equal to 75°F or mean daily ambient air temperature, whichever is greater.

The temperature shall not be elevated above 56°F in the reach from Keswick Dam to Hamilton City nor above 68°F in the reach from Hamilton City to the I Street Bridge during periods when temperature increases will be detrimental to the fishery.

APPLICABLE WATER BODY

Sacramento River from its source to Box Canyon Reservoir (9); Sacramento River from Box Canyon Dam to Shasta Lake (11)

Lake Siskiyou (10)

Sacramento River from Shasta Dam to I Street Bridge (13, 30)

The following site-specific objective replaces the general temperature objective, above, in its entirety for the listed water body:

For Deer Creek, source to Cosumnes River, temperature changes due to controllable factors shall not cause creek temperatures to exceed the objectives specified in Table III-4A.

TABLE III-4A
DEER CREEK TEMPERATURE OBJECTIVES

Date	Daily Maximum (°F) ^a	Monthly Average (°F) ^b
January and February	63	58
March	65	60
April	71	64
May	77	68
June	81	74
July through Sept.	81	77
October	77	72
November	73	65
December	65	58

^a Maximum not to be exceeded.

^b Defined as a calendar month average.

information, in addition to using State Water Board data or collecting its own.

Whatever actions the Regional Water Board implements must be consistent with the Basin Plan's beneficial uses and water quality objectives, as well as certain State and Regional Water Boards' policies, plans, agreements, prohibitions, guidance, and other restrictions or requirements. These considerations are described below and included in the Appendix when noted.

Control Action Considerations of the State Water Board

Policies and Plans

The State Water Board adopts water quality control policies and water quality control plans to which Regional Water Board actions must conform. Sections 13146 and 13247 of the California Water Code generally require that, in carrying out activities which affect water quality, all state agencies, departments, boards and offices must comply with all policies for water quality control and with applicable water quality control plans approved or adopted by the State Water Board. Two of the plans, the Ocean Plan and the Tahoe Plan, do not affect the Sacramento and San Joaquin River Basins. The policies and plans that are applicable are described below.

1. *The State Policy for Water Quality Control*

This policy declares the State Water Board's intent to protect water quality through the implementation of water resources management programs and serves as the general basis for subsequent water quality control policies. The policy was adopted by the State Water Board in 1972. See Appendix Item 1.

2. *State Water Board Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality of Water in California*

The State Water Board adopted this policy on 28 October 1968. The policy generally restricts the Regional Water Board and dischargers from reducing the water quality of surface or ground waters even though such a reduction in water quality might still allow the protection of the beneficial uses associated with the water prior to the quality reduction. The goal of the policy is to maintain high quality waters.

Changes in water quality are allowed only if the change is consistent with maximum benefit to the people of the State; does not unreasonably affect present and anticipated beneficial uses; and, does not result in water quality less than that prescribed in water quality control plans or policies.

USEPA water quality standards regulations require each state to adopt an "antidegradation" policy and specify the minimum requirements for the policy (40 CFR 131.12). The State Water Board has interpreted State Water Board Resolution No. 68-16 to incorporate the federal antidegradation policy. The Regional Water Board implements Resolution No. 68-16 consistent with the federal antidegradation policy where the federal regulations apply. Resolution No. 68-16 applies to both ground and surface waters of the state. Resolution No. 68-16 is Appendix Item 2; the federal policy is Appendix Item 39.

3. *State Water Board Resolution No. 74-43, The Water Quality Control Policy for the Enclosed Bays and Estuaries of California*

This policy was adopted by the State Water Board on 16 May 1974 and provides water quality principles and guidelines for the prevention of water quality degradation in enclosed bays and estuaries to protect the beneficial uses of such waters. The Regional Water Board must enforce the policy and take actions consistent with its provisions. (This policy does not apply to wastes from boats or land runoff except as specifically indicated for siltation and combined sewer flows.) See Appendix Item 3.

4. *State Water Board Resolution No. 75-58, Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling*

This policy was adopted by the State Water Board in June 1975. Its purpose is to provide consistent principles and guidance for supplementary waste discharge requirements or other water quality control actions for thermal powerplants using inland waters for cooling. The Regional Water Board is responsible for its enforcement. See Appendix Item 4.

11. *State Water Board Resolution No. 93-62, Policy for Regulation of Discharges of Municipal Solid Waste*

The policy for water quality control, adopted by State Water Board on 17 June 1993, directs Regional Water Boards to amend waste discharge requirements for municipal solid waste landfills to incorporate pertinent provisions of the federal "Subtitle D" regulations under the Resource Conservation and Recovery Act (40 CFR Parts 257 & 258). The majority of the provisions of the Subtitle D regulations become effective on 9 October 1993. Landfills which are subject to the Subtitle D regulations and the Policy are those which have accepted municipal solid waste on or after 9 October 1991. See Appendix Item 10.

12. *The Thermal Plan*

The Water Quality Control Plan for the Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California was adopted by the State Water Board on 18 May 1972 and amended 18 September 1975. The plan specifies water quality objectives, effluent quality limits, and discharge prohibitions related to thermal characteristics of interstate waters and waste discharges. See Appendix Item 11. (Note: the State Water Board adopted Resolution No. 92-82 on 22 October 1992, approving an exception to the Thermal Plan for Sacramento Regional County Sanitation District. See Appendix Item 12.)

13. *The Delta Plan, Water Right Decision 1485, and the Water Quality Control Plan for Salinity*

In August 1978, the State Water Board adopted the Delta Plan and Water Right Decision 1485 (D-1485). The Delta Plan contained water quality standards, Delta outflow requirements and export constraints for the Delta. These standards, requirements, and constraints were then implemented in D-1485 by making them conditions of the water right permits for the Central Valley Project and the State Water Project.

When the Delta Plan and accompanying D-1485 were originally issued, the State Water Board committed itself to review the Delta Plan in about ten years. In 1986, the State Court of Appeal issued a decision addressing legal challenges to the Delta Plan and D-1485. The

Court directed the State Water Board to take a global view toward its dual responsibilities (water quality and water rights) to the State's water resources.

In response to the Court's decision, the State Water Board adopted the Water Quality Control Plan for Salinity in May 1991. The May 1991 Plan was superceded in May 1995 when the State Water Board adopted the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary. This Plan was revised in 2006. The State Water Board's Plan includes water quality objectives for salinity, temperature and dissolved oxygen that are applicable in the Delta.

In December 1999 the State Water Board adopted, and in March 2000 per Order WR 2000-02 revised, Water Right Decisions 1641. This decision amended certain water rights by assigning responsibilities to water right holders to help meet flow objectives intended to implement certain water quality objectives contained in the 1995 Bay-Delta Plan.

Rather than taking any water right action to meet the dissolved oxygen objectives in the 1995 Bay-Delta Plan, the State Water Board directed the Regional Water Board to first prepare a TMDL to achieve the dissolved oxygen objectives and implement it.

14. *Nonpoint Source Management Plan and the Nonpoint Source Implementation and Enforcement Policy*

In December 1999, the State Water Board, in its continuing efforts to control nonpoint source (NPS) pollution in California, adopted the *Plan for California's Nonpoint Source Pollution Control Program* (NPS Program Plan). The NPS Program Plan upgraded the State's first *Nonpoint Source Management Plan* adopted by the State Water Board in 1988 (1988 Plan). Upgrading the 1988 Plan with the NPS Program Plan brought the State into compliance with the requirements of Section 319 of the Clean Water Act and Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990.

The NPS Implementation and Enforcement Policy, adopted by the State Water Board on 20 May 2004 (State Water Board Resolution No. 2004-0030), explains how the Porter-Cologne Act mandates and authorities, delegated to the

State Water Board and Regional Water Boards by the California Legislature, will be used to implement and enforce the NPS Program Plan. The policy also provides a bridge between the NPS Program Plan and the *SWRCB Water Quality Enforcement Policy*.

15. *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California” (a.k.a. State Implementation Plan or SIP)*

In March 2000, the State Water Board adopted the SIP in Resolution No. 2000-015. This Policy establishes:

- (1) Implementation provisions for priority pollutant criteria promulgated by the U.S. Environmental Protection Agency (U.S. EPA) through the National Toxics Rule (40 CFR 131.36) (promulgated on 22 December 1992 and amended on 4 May 1995) and through the California Toxics Rule (40 CFR 131.38) (promulgated on 18 May 2000 and amended on 13 February 2001), and for priority pollutant objectives established by Regional Water Boards in their basin plans; and
- (2) Monitoring requirements for 2,3,7,8-TCDD equivalents; and
- (3) Chronic toxicity control provisions.

In addition, this Policy includes special provisions for certain types of discharges and factors that could affect the application of other provisions in this Policy.

16. *Water Quality Enforcement Policy (Enforcement Policy)*

The State Water Board adopted the Enforcement Policy on 19 February 2002. The primary goal of this Enforcement Policy is to create a framework for identifying and investigating instances of noncompliance, for taking enforcement actions that are appropriate in relation to the nature and severity of the violation, and for prioritizing enforcement resources to achieve maximum environmental benefits.

17. *Water Quality Control Policy for Developing California’s Clean Water Act Section 303(d) List*

Pursuant to California Water Code section 13191.3(a), this State policy for water quality

control describes the process by which the State Water Board and the regional water boards will comply with the listing requirements of section 303(d) of the federal Clean Water Act. The objective of this policy is to establish a standardized approach for developing California’s section 303(d) list in order to achieve the overall goal of achieving water quality standards and maintaining beneficial uses in all of California’s surface waters.

18. *Water Quality Control Policy for Addressing Impaired Waters: Regulatory Structure and Options*

Section 303(d) of the Clean Water Act requires states to identify waters within their borders that are not attaining water quality standards. This State policy for water quality control describes the existing tools and mechanisms that the regional water boards will use to address the water bodies listed as impaired under section 303(d) of the federal Clean Water Act.

19. *Policy for Compliance Schedules in National Pollutant Discharge Elimination System Permits*

The Policy authorizes the Regional Water Board to include a compliance schedule in a permit for an existing discharger to implement a new, revised, or newly interpreted water quality objective or criterion in a water quality standard that results in a permit limitation more stringent than the limitation previously imposed.

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Programs

1. *Discharges of Hazardous Waste to Land, California Code of Regulations Title 23, Division 3, Chapter 15 and Consolidated Regulations for Treatment, Storage, Processing or Disposal of Solid Waste, California Code of Regulations Title 27, Division 2, Subdivision*

Title 23, CCR, Division 3 Chapter 15 and Title 27 CCR, Division 2, Subdivision 1 includes regulations governing discharges of hazardous and solid waste to land for treatment, storage, or disposal. The regulations cover landfills, surface impoundments, waste piles, land treatment units, mining waste management units and confined animal facilities. In addition, actions to clean up and abate conditions of pollution or nuisance at contaminated sites are covered by relevant portions of the regulations where contaminated materials are taken off-site for treatment, storage, or disposal and, as feasible, where wastes are contained or remain on-site at the completion of cleanup actions. The regulations classify wastes according to their threat to water quality, classify waste management units according to the degree of

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San Joaquin valley regarding vegetation management in wastewater treatment facilities. The MOU designates the Districts as lead agencies in determining the adequacy of vegetation management operations in abating mosquito breeding sources. Included in the MOU are the definition of vegetative management operations and conditions to protect nesting birds, eggs, and nests. See Appendix Item 30.

Regional Water Board Waivers

State law allows Regional Water Boards to conditionally waive WDRs for a specific discharge or types of discharges where the waiver is consistent with any applicable state or regional water quality control plan and it is in the public interest. A waiver may not exceed five years in duration, but may be renewed by a Regional Water Board. Waiver conditions must include monitoring requirements unless the Regional Water Board determines that the discharge does not pose a significant threat to water quality. Prior to renewing any waiver for a specific type of discharge, the Regional Water Board shall review the terms of the waiver policy at a public hearing. At the hearing, the Regional Water Board shall determine whether the discharge for which the waiver policy was established should be subject to general or individual waste discharge requirements. (Water Code Section 13269)

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The Regional Water Board may, after compliance with the California Environmental Quality Act (CEQA), allow short-term variances from Basin Plan provisions, if determined to be necessary to implement control measures for vector and weed control, pest eradication, or fishery management which are being conducted to fulfill statutory requirements under California's Fish and Game, Food and Agriculture, or Health and Safety Codes. In order for the Regional Water Board to determine if a variance is appropriate, agencies proposing such activities must submit to the Regional Water Board project-specific information, including measures to mitigate adverse impacts.

Regional Water Board Prohibitions

The Porter-Cologne Water Quality Control Act allows the Regional Water Board to prohibit certain discharges (Water Code Section 13243). Prohibitions may be revised, rescinded, or adopted as necessary. The prohibitions applicable to the Sacramento and San Joaquin River Basins are identified and described below.

[NOTE: Costs incurred by any unit of local government for a new program or increased level of service for compliance with discharge prohibitions in the Basin Plan do not require reimbursement by the State per Section 2231 of the Revenue and Taxation Code, because the Basin Plan implements a mandate previously enacted by statute, Chapter 482, Statutes of 1969.]

1. Water Bodies

Water bodies for which the Regional Water Board has held that the direct discharge of wastes is inappropriate as a permanent disposal method include sloughs and streams with intermittent flow or limited dilution capacity. The direct discharge of municipal and industrial wastes (excluding storm water discharges) into the following specific water bodies has been prohibited, as noted:

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2. The State Water Board should consider the continued conditioning of water rights on the attainment of existing and new water quality objectives for salinity in the Lower San Joaquin River, when these objectives cannot be met through discharge controls alone.

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

1. The State Water Board should consider amending water right permits for existing activities that reduce flow through the DWSC to require that the associated impacts on excess net oxygen demand conditions in the DWSC be evaluated and their impacts reduced in accordance with the *Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the DWSC*.
2. The State Water Board should consider requiring evaluation and full mitigation of the potential impacts of future water right permits or water transfer applications on reduced flow and excess net oxygen demand conditions in the DWSC.

Delta Mercury

1. The State Water Board should consider requiring methylmercury controls for new water management activities that have the potential to increase ambient methylmercury levels as a condition of approval of any water right action required to implement the project. The State Water Board Division of Water Rights should consider requiring the evaluation and implementation of feasible management practices to reduce or, at a minimum, prevent methylmercury ambient levels from increasing from those changes in water management activities and flood conveyance projects that have the potential to increase methylmercury levels. The State Water Board should consider funding or conducting studies to develop and evaluate management practices to reduce methylmercury production resulting from existing water management activities or flood conveyance projects.
2. During future reviews of the salinity objectives contained in the Bay-Delta Plan, the State Water Board Division of Water Rights should consider conducting studies to determine whether proposed changes to salinity objectives could affect methylmercury production and should consider the results of these studies in evaluating changes to the salinity objectives.

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Recommended for Implementation by Other Agencies

Water Resources Facilities

1. Consideration should be given to the construction of a storage facility to store surplus wet-weather Delta outflows. Construction should be contingent on studies demonstrating that some portion of wet-weather Delta outflow is truly surplus to the Bay-Delta system.
2. Consideration should be given to the use of excess capacity in west San Joaquin Valley conveyances, or of using a new east valley conveyance to:
 - a. Augment flows and improve water quality in the San Joaquin River and southern Delta with the goal of achieving water quality as described in Table IV-3.

TABLE IV-3

<u>TDS MG/L</u>	<u>TYPE PF YEAR¹</u>			
	<u>CRITICAL²</u>	<u>DRY³</u>	<u>NORMA⁴</u>	<u>WET⁴</u>
Max. 3-day (arith. avg.)	500	500	500	500
Maximum (annual avg.)	385	385	385	285
Max. May-Sep (arith. avg.)	300	250	250	250
Max. 3-Day May-Sep (arith Avg.)	450	350	350	350

1 Relative to unimpaired runoff to Delta Based on 1922 - 1971 period. See definitions in Figure III-2
 2 Less than 57% , or less than 70% when preceding year critical
 3 Less than 70%, or less than 90% when preceding year critical
 4 Greater than 125%

- b. Prevent further ground water overdrafts and associated quality problems.

3. Agencies responsible for existing water resources facilities that reduce flow through the Stockton Deep Water Ship Channel (DWSC) should evaluate and reduce their impacts on excess net oxygen demand conditions in the DWSC in accordance with the *Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the DWSC*.
4. Agencies responsible for future water resources facilities projects, which potentially reduce flow through the DWSC, should evaluate and fully mitigate the potential negative impacts on excess net oxygen demand conditions in the DWSC.

Agricultural Drainage Facilities

Facilities should be constructed to convey agricultural drain water from the San Joaquin and Tulare Basins. It is the policy of the Regional Water Board to encourage construction. The discharge must comply with water quality objectives of the receiving water body.

Subsurface Agricultural Drainage

1. The entire drainage issue is being handled as a watershed management issue. The entities in the Drainage Problem Area and entities within the remainder of the Grassland watershed need to

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establish a regional entity with authority and responsibility for drain water management.

2. The regional drainage entity and agricultural water districts should consider adopting economic incentive programs as a component of their plans to reduce pollutant loads. Economic incentives can be an effective institutional means of promoting on-farm changes in drainage and water management.
3. If fragmentation of the parties that generate, handle and discharge agricultural subsurface drainage jeopardizes the achievement of water quality objectives, the Regional Water Board will consider petitioning the Legislature for the formation of a regional drainage district.
4. The Legislature should consider putting additional bond issues before the voters to provide low interest loans for agricultural water conservation and water quality projects and incorporating provisions that would allow recipients to be private landowners, and that would allow irrigation efficiency improvement projects that reduce drainage discharges to be eligible for both water conservation funds and water quality facilities funds.
5. The San Joaquin Valley Drainage Implementation Program or other appropriate agencies should continue to investigate the alternative of a San Joaquin River Basin drain to move the existing discharge point for poor quality agricultural subsurface drainage to a location where its impact on water quality is less.
6. The selenium water quality objective for the wetland channels can not be achieved without removal of drainage water from these channels. The present use of the Grassland channels has developed over a 30-year period through agreements between the dischargers, water and irrigation districts, the U.S. Bureau of Reclamation, the California Department of Water Resources, the U.S. Fish and Wildlife Service, the California Department of Fish and Game, the Grassland Water District and the Grassland Resource Conservation District. Because each entity shared in the development of the present drainage routing system, each shares the responsibility for implementation of a wetlands bypass.

Stockton Deep Water Ship Channel (DWSC)

1. The U.S. Army Corps of Engineers should reduce the impacts of the existing DWSC geometry on

excess net oxygen demand conditions in accordance with the *Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the DWSC*.

Delta Mercury

1. USEPA and the California Air Resources Board should work with the State Water Board and develop a memorandum of understanding to evaluate local and statewide mercury air emissions and deposition patterns and to develop a load reduction program(s).
2. The State of California should establish the means to fund a portion of the mercury control projects in the Delta and upstream watersheds.
3. Watershed stakeholders are encouraged to identify total mercury and methylmercury reduction projects and propose and conduct projects to reduce upstream non-point sources of methylmercury and total mercury. The Regional Water Board recommends that state and federal grant programs give priority to projects that reduce upstream non-point sources of methylmercury and total mercury.
4. Dischargers may evaluate imposed administrative civil liabilities projects for total mercury and methylmercury discharge and exposure reduction projects, consistent with Supplemental Environmental Project policies.

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CONTINUOUS PLANNING FOR IMPLEMENTATION OF WATER QUALITY CONTROL

In order to effectively protect beneficial uses, the Regional Water Board updates the Basin Plan regularly in response to changing water quality conditions. The Regional Water Board is periodically apprised of water quality problems in the Sacramento and San Joaquin River Basins, but the major review of water quality is done every three years as part of the Triennial Review of water quality standards.

During the triennial review, the Regional Water Board holds a public hearing to receive comments on actual and potential water quality problems. A workplan is prepared which identifies the control actions that will be implemented over the succeeding three years to address the problems. The actions may include or result in revision of the Basin Plan's water quality standards if that is an appropriate problem remedy. Until such time that a basin plan is revised, the triennial review also serves to reaffirm existing standards.

The control actions that are identified through the triennial review process are incorporated into the Basin Plan to meet requirements to describe actions (to achieve objectives) and a time schedule of their implementation as called for in the Water Code, Section 13242(a) and (b). The actions recommended in the most recent triennial review are described in the following section.

ACTIONS AND SCHEDULE TO ACHIEVE WATER QUALITY OBJECTIVES

Agricultural Drainage Discharges in the San Joaquin River Basin

Water quality in the San Joaquin River has degraded significantly since the late 1940s. During this period, salt concentrations in the River, near Vernalis, have doubled. Concentrations of boron, selenium, molybdenum and other trace elements have also increased. These increases are primarily due to reservoir development on the east side tributaries and upper basin for agricultural development, the use of poorer quality, higher salinity, Delta water in lieu of San Joaquin River water on west side agricultural

lands and drainage from upslope saline soils on the west side of the San Joaquin Valley. Point source discharges to surface waters only contribute a small fraction of the total salt and boron loads in the San Joaquin River.

The water quality degradation in the River was identified in the 1975 Basin Plan and the Lower San Joaquin River was classified as a Water Quality Limited Segment. At that time, it was envisioned that a Valley-wide Drain would be developed and these subsurface drainage water flows would then be discharged outside the Basin, thus improving River water quality. However, present day development is looking more toward a regional solution to the drainage water discharge problem rather than a valley-wide drain.

Because of the need to manage salt and other pollutants in the River, the Regional Water Board began developing a Regional Drainage Water Disposal Plan for the Basin. The development began in FY 87/88 when Basin Plan amendments were considered by the Water Board in FY 88/89. The amendment development process included review of beneficial uses, establishment of water quality objectives, and preparation of a regulatory plan, including a full implementation plan. The regulatory plan emphasized achieving objectives through reductions in drainage volumes and pollutant loads through best management practices and other on-farm methods.

The 88/89 amendment emphasized toxic elements in subsurface drainage discharges. The Regional Water Board however still recognizes salt management as the most serious long-term issue on the San Joaquin River. Salinity impairment in the Lower San Joaquin River remains a persistent problem as salinity water quality objectives continue to be exceeded. The Regional Water Board adopted the following control program for salt and boron in the Lower San Joaquin River to address salt and boron impairment and to bring the river into compliance with water quality objectives. Additionally, the Regional Water Board will continue as an active participant in the San Joaquin River Management Program implementation phase, as

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cleanup of mines or compliance with the erosion control requirements is the responsibility of the entity performing the cleanup or erosion control.

Delta Mercury Control Program

The Delta Mercury Control Program applies specifically to the Delta and Yolo Bypass waterways listed in Appendix 43.

This amendment was adopted by the Regional Water Quality Control Board on 22 April 2010, and approved by the U.S. Environmental Protection Agency on 20 October 2011. The Effective Date of the Delta Mercury Control Program shall be 20 October 2011, the date of U.S. EPA approval.

Program Overview

The Delta Mercury Control Program is designed to protect people eating one meal/week (32 g/day) of trophic levels 3 and 4 Delta fish, plus some non-Delta (commercial market) fish. The Regional Water Board recognizes that some consumers eat four to five meals per week (128-160 g/day) of a variety of Delta fish species. The fish tissue objectives will be re-evaluated during the Phase 1 Delta Mercury Control Program Review and later program reviews to determine whether objectives protective of a higher consumption rate can be attained as methylmercury reduction actions are developed and implemented.

Additional information about methylmercury source control methods must be developed to determine how and if Dischargers can attain load and waste load allocations set by the Board. Information is also needed about the methylmercury control methods' potential benefits and adverse impacts to humans, wildlife, and the environment. Therefore, the Delta Mercury Control Program will be implemented through a phased, adaptive management approach.

Phase 1 spans from 20 October 2011 through the Phase I Delta Mercury Control Program Review, expected to be by 20 October 2020. Phase 1 emphasizes studies and pilot projects to develop and evaluate management practices to control methylmercury. Phase 1 includes provisions for: implementing pollution minimization programs and interim mass limits for inorganic (total) mercury point sources in the Delta and Yolo Bypass; controlling sediment-bound mercury in the Delta and Yolo Bypass that may become methylated in agricultural lands, wetland, and open-water habitats; and reducing total mercury loading to San Francisco

Bay, as required by the Water Quality Control Plan for the San Francisco Bay Basin.

Phase 1 also includes: the development of upstream mercury control programs for major tributaries; the development and implementation of a mercury exposure reduction program to protect humans; and the development of a mercury offset program.

At the end of Phase 1, the Regional Water Board shall conduct a Phase 1 Delta Mercury Control Program Review that considers: modification of methylmercury goals, objectives, allocations and/or the Final Compliance Date; implementation of management practices and schedules for methylmercury controls; and adoption of a mercury offset program for dischargers who cannot meet their load and waste load allocations after implementing all reasonable load reduction strategies. The review also shall consider other potential public and environmental benefits and negative impacts (e.g., habitat restoration, flood protection, water supply, fish consumption) of attaining the allocations. The fish tissue objectives, the linkage analysis between objectives and sources, and the attainability of the allocations will be re-evaluated based on the findings of Phase 1 control studies and other information. The linkage analysis, fish tissue objectives, allocations, and time schedules shall be adjusted at the end of Phase 1, or subsequent program reviews, if appropriate.

Phase 2 begins after the Phase 1 Delta Mercury Control Program Review or 20 October 2022, whichever occurs first, and ends in 2030. During Phase 2, dischargers shall implement methylmercury control programs and continue inorganic (total) mercury reduction programs. Compliance monitoring and implementation of upstream control programs also shall occur in Phase 2.

Load and Waste Load Allocations

Final methylmercury waste load allocations for point sources and load allocations for non-point sources are listed in Tables IV-7A through IV-7D. For each subarea listed in Table IV-7A, the sum of allocations for agricultural drainage, atmospheric wet deposition, open water, urban (nonpoint source), and wetlands and the individual allocations for tributary inputs (Table IV-7D), NPDES facilities and NPDES facilities future growth (Table IV-7B), and NPDES MS4 (Table IV-7C) within that subarea equals that subarea's assimilative capacity. New or expanded methylmercury discharges that begin after 20 October 2011 may necessitate adjustments to the allocations.

Load allocations are specific to Delta subareas, which are shown on Figure A43. The load allocations for each Delta subarea apply to the sum of annual methylmercury loads produced by different types of nonpoint sources: agricultural lands, wetlands, and open-water habitat in each subarea, as well as atmospheric wet deposition to each subarea (Table IV-7A), and runoff from urban areas outside of Municipal Separate Storm Sewer System (MS4) service areas. The subarea allocations apply to both existing and future discharges.

Waste load allocations apply to point sources, which include individual NPDES permitted facility discharges and runoff from urban areas within MS4 service areas within the Delta and Yolo Bypass (Tables IV-7B and IV-7C, respectively).

Methylmercury allocations are assigned to tributary inputs to the Delta and Yolo Bypass (Table IV-7D). Future upstream control programs are planned for tributaries to the Delta through which management practices will be implemented to meet load allocations for tributary inputs assigned by the Delta Mercury Control Program.

Load allocations for the tributary inputs, urban areas outside of MS4 service areas, open-water habitat, and atmospheric deposition, and waste load allocations for the MS4s, are based on water years 2000 through 2003, a relatively dry period. Annual loads are expected to fluctuate with rainfall volume and other factors. As a result, attainment of these allocations shall be assessed as a five-year average annual load. Allocations for these sources will be re-evaluated during review of the Phase 1 Delta Mercury Control Program as wet year data become available.

Margin of Safety

The Delta Mercury Control program includes an explicit margin of safety of 10%.

Final Compliance Date

Methylmercury load and waste load allocations for dischargers in the Delta and Yolo Bypass shall be met as soon as possible, but no later than 2030, unless the Regional Water Board modifies the implementation schedule and Final Compliance Date.

During Phase 1, all dischargers shall implement reasonable, feasible controls for inorganic (total) mercury.

All dischargers should implement methylmercury management practices identified during Phase 1 that are reasonable and feasible. However, implementation of methylmercury management practices identified in Phase 1 is not required for the purposes of achieving methylmercury load allocations for nonpoint sources until the beginning of Phase 2.

The Regional Water Board will, as necessary, include schedules of compliance in NPDES permits for compliance with water quality-based effluent limits based on the waste load allocations. The compliance schedules must be consistent with the requirements of federal laws and regulations, including, USEPA regulations 40 CFR 122.47, State laws and regulations, including State Water Board Policy for Compliance Schedules in National Pollutant Discharge Elimination System Permits, and the Final Compliance Date. The Regional Board will review the feasibility of meeting wasteload allocations based on reliable data and information regarding variability in methylmercury concentrations and treatment efficiencies and time needed to comply with the wasteload allocations. The Phase 1 Control Studies are designed to provide this information. As needed, the Regional Board shall incorporate the Phase 1 Control Studies into compliance schedules. When Phase 1 studies are complete, the Regional Board will review the need for additional time during Phase 2 for NPDES permittees to comply with the final wasteload allocations.

Implementation Program

Point Sources

The regulatory mechanism to implement the Delta Mercury Control Program for point sources shall be through NPDES permits.

Requirements for NPDES Permitted Facilities

By 20 April 2012, all facilities listed in Table IV-7B shall submit individual pollutant minimization program workplans to the Regional Water Board. The dischargers shall implement their respective pollutant minimization programs within 30 days after receipt of written Executive Officer approval of the workplans. Until the NPDES permitted facility achieves compliance with its waste load allocation, the discharger shall submit annual progress reports on pollution minimization activities implemented and evaluation of their effectiveness, including a summary of mercury and methylmercury monitoring results.

During Phase 1, all facilities listed in Table IV-7B shall limit their discharges of inorganic (total) mercury to facility performance-based levels. The interim inorganic (total) mercury effluent mass limit is to be derived using current, representative data and shall not exceed the 99.9th percentile of 12-month running effluent inorganic (total) mercury loads (lbs/year). For intermittent dischargers, the interim inorganic (total) mercury effluent mass limit shall consider site-specific discharge conditions. The limit shall be assigned in permits and reported as an annual load based on a calendar year. At the end of Phase 1, the interim inorganic (total) mercury mass limit will be re-evaluated and modified as appropriate.

NPDES permitted facilities that begin discharging to the Delta or Yolo Bypass during Phase 1 shall comply with the above requirements.

Requirements for NPDES Permitted Urban Runoff Discharges

MS4 dischargers listed in Table IV-7C shall implement best management practices (BMPs) to control erosion and sediment discharges consistent with their existing permits and orders with the goal of reducing mercury discharges.

The Sacramento MS4 (CAS082597), Contra Costa County MS4 (CAS083313), and Stockton MS4 (CAS083470) permittees shall implement pollution prevention measures and BMPs to minimize total mercury discharges. This requirement shall be implemented through mercury reduction strategies required by their existing permits and orders. Annually, the dischargers shall report on the results of monitoring and a description of implemented pollution prevention measures and their effectiveness.

The Sacramento MS4 (CAS082597), Contra Costa County MS4 (CAS083313), and Stockton MS4 (CAS083470) shall continue to conduct mercury control studies to monitor and evaluate the effectiveness of existing BMPs per existing requirements in permits and orders, and to develop and evaluate additional BMPs as needed to reduce their mercury and methylmercury discharges into the Delta and Yolo Bypass.

Nonpoint Sources

Nonpoint sources shall be regulated through the authority contained in State and federal laws and regulations, including State Water Board's Nonpoint Source Implementation and Enforcement Policy.

Table IV-7A contains methylmercury load allocations for non-point sources in the Delta and Yolo Bypass waterways listed in Appendix 43.

During Phase 1, all nonpoint sources in the Delta and Yolo Bypass shall implement reasonable, feasible actions to reduce sediment in runoff with the goal of reducing inorganic mercury loading to the Yolo Bypass and Delta, in compliance with existing Basin Plan objectives and requirements, and Irrigated Lands Regulatory Program requirements.

Attainment of methylmercury load allocations at the end of 2030 will be determined by comparing monitoring data and documentation of methylmercury management practice implementation for each subarea with loads specified in Table IV-7A and Table IV-7D.

For subareas not in compliance with allocations by 2030, the Regional Water Board may develop load allocations for individual sources and require individual monitoring and waste discharge requirements.

In subareas needing reductions in methylmercury, proponents of new wetland and wetland restoration projects scheduled for construction after 20 October 2011 shall (a) participate in Control Studies as described below, or shall implement site-specific study plans, that evaluate practices to minimize methylmercury discharges, and (b) implement methylmercury controls as feasible. New wetland projects may include pilot projects and associated monitoring to evaluate management practices that minimize methylmercury discharges.

Phase 1 Control Studies

Point and nonpoint source dischargers, working with other stakeholders, shall conduct methylmercury control studies (Control Studies) to evaluate existing control methods and, as needed, develop additional control methods that could be implemented to achieve their methylmercury load and waste load allocations. The Regional Water Board will use the Phase 1 Control Studies' results and other information to consider amendments to the Delta Mercury Control Program during the Phase 1 Delta Mercury Control Program Review. A Technical Advisory Committee, described below, will review the Control Studies' designs and results.

Study Participants

Control Studies can be developed through a stakeholder group approach or other collaborative mechanism, or by individual dischargers. Individual dischargers are not required to do individual studies

if the individual dischargers join a collaborative study group(s).

Control Studies are required for:

- a. Irrigated agricultural lands that discharge to the Yolo Bypass and Delta subareas that require methylmercury source reductions.
- b. Managed wetlands and wetland restoration projects that discharge to the Yolo Bypass and Delta subareas that require methylmercury source reductions.
- c. Existing NPDES permitted facilities in the Delta and the Yolo Bypass (listed in Table IV-7B).
- d. Sacramento Area MS4, Stockton MS4, and Contra Costa County MS4 service areas within and upstream of the legal Delta boundary.
- e. State and Federal agencies whose activities affect the transport of mercury and the production and transport of methylmercury through the Yolo Bypass and Delta, or which manage open water areas in the Yolo Bypass and Delta, including but not limited to Department of Water Resources, State Lands Commission, Central Valley Flood Protection Board, U.S. Army Corps of Engineers, and U.S. Bureau of Reclamation. If appropriate during Phase 1, the Executive Officer will require other water management agencies whose activities affect methylmercury levels in the Delta and Yolo Bypass to participate in the Control Studies.
- f. Other significant sources of methylmercury not listed above, as identified and deemed appropriate by the Executive Officer.

Dischargers in the Central Valley that are not subject to the Delta Mercury Control Program but may be subject to future mercury control programs in upstream tributary watersheds are encouraged to participate in the coordinated Delta Control Studies. Dischargers in and upstream of the Delta who participate in the Control Studies will be exempt from conducting equivalent Control Studies required by future upstream mercury control programs.

Study Objectives

The Control Studies shall evaluate existing control methods and, as needed, additional control methods that could be implemented to achieve methylmercury load and waste load allocations. The Control Studies shall evaluate the feasibility of reducing sources more than the minimum amount needed to achieve allocations.

Phase 1 studies also may include an evaluation of innovative actions, watershed approaches, offsets projects, and other short and long-term actions that result in reducing inorganic (total) mercury and methylmercury to address the accumulation of methylmercury in fish tissue and to reduce methylmercury exposure.

Dischargers may evaluate the effectiveness of using inorganic (total) mercury controls to control methylmercury discharges.

Dischargers may conduct characterization studies to inform and prioritize the Control Studies. Characterization studies may include, but not be limited to, evaluations of methylmercury and total mercury concentrations and loads in source waters, receiving waters, and discharges, to determine which discharges act as net sources of methylmercury, and which land uses result in the greatest net methylmercury production and loss.

Final reports for Control Studies shall include a description of methylmercury and/or inorganic (total) mercury management practices identified in Phase 1; an evaluation of the effectiveness, and costs, potential environmental effects, and overall feasibility of the control actions. Final reports shall also include proposed implementation plans and schedules to comply with methylmercury allocations as soon as possible.

If the Control Study results indicate that achieving a given methylmercury allocation is infeasible, then the discharger, or an entity representing a discharger, shall provide detailed information on why full compliance is not achievable, what methylmercury load reduction is achievable, and an implementation plan and schedule to achieve partial compliance.

Control Study Workplans

Control Studies shall be implemented through Control Study Workplan(s). The Control Study Workplan(s) shall provide detailed descriptions of how methylmercury control methods will be identified, developed, and monitored, and how effectiveness, costs, potential environmental effects, and overall feasibility will be evaluated for the control methods.

The Control Study Workplan(s) shall include details for organizing, planning, developing, prioritizing, and implementing the Control Studies.

The Control Studies will be governed using an Adaptive Management approach.

Technical Advisory Committee and Adaptive Management Approach

The Regional Water Board commits to supporting an Adaptive Management approach. The adaptive management approach includes the formation of a Stakeholder Group(s) and a Technical Advisory Committee (TAC). Regional Water Board staff, working with the TAC and Stakeholder Group(s), will provide a Control Study Guidance Document for stakeholders to reference.

The TAC shall be comprised of independent experts who would convene as needed to provide scientific and technical peer review of the Control Study Workplan(s) and results, advise the Board on scientific and technical issues, and provide recommendations for additional studies and implementation alternatives developed by the dischargers. The Board shall form and manage the TAC with recommendations from the dischargers and other stakeholders, including tribes and community organizations.

Board staff shall work with the TAC and Stakeholder Group(s) to review the Control Study Workplan(s) and results. As new information becomes available from the Control Studies or outside studies that result in redirection and/or prioritization of existing studies, dischargers may amend the Control Study Workplan(s) with Executive Officer approval.

Mercury Control Studies Schedule

1. By 20 April 2012, entities required to conduct Control Studies shall submit for Executive Officer approval either: (1) a report(s) describing how dischargers and stakeholders plan to organize to develop a coordinated, comprehensive Control Study Workplan(s), or (2) a report describing how individual dischargers will develop individual Control Study Workplans. For dischargers conducting coordinated studies, the report shall include a list of participating dischargers, stakeholders, tribes, and community groups. Dischargers shall be considered in compliance with this reporting requirement upon written commitment to either be part of a group developing a Control Study Workplan or develop an individual Control Study Workplan.
2. Control Study Workplans shall be submitted to the Regional Water Board by 20 July 2012. With Executive Officer approval, an additional nine months may be allowed for Workplans being developed by a collaborative stakeholder approach. The Control Study Workplan(s) shall contain a detailed plan for the Control

Studies and the work to be accomplished during Phase 1. Regional Water Board staff and the TAC will review the Workplans and provide recommendations for revising Workplans if necessary.

Within four months of submittal, the Executive Officer must determine if the Workplans are acceptable. After four months, Workplans are deemed approved and ready to implement if no written approval is provided by the Executive Officer, unless the Executive Officer provides written notification to extend the approval process.

Dischargers shall be considered in compliance with this reporting requirement upon timely submittal of workplans and revisions.

3. By 20 October 2015, entities responsible for Control Studies shall submit report(s) to the Regional Water Board documenting progress towards complying with the Control Study Workplan(s). The report shall include amended workplans for any additional studies needed to address methylmercury reductions. The TAC will review the progress reports and may recommend what additional or revised studies should be undertaken to complete the objectives of the Control Studies. Staff will review the progress reports and recommendations of the TAC and provide a progress report to the Regional Water Board.
4. By 20 October 2018, entities responsible for Control Studies shall complete the studies and submit to the Regional Water Board Control Studies final reports that present the results and descriptions of methylmercury control options, their preferred methylmercury controls, and proposed methylmercury management plan(s) (including implementation schedules), for achieving methylmercury allocations. In addition, final report(s) shall propose points of compliance for non-point sources.

If the Executive Officer determines that dischargers are making significant progress towards developing, implementing and/or completing the Phase 1 Control Studies but that more time is needed to finish the studies, the Executive Officer may consider extending a study's deadlines.

The Executive Officer may, after public notice, extend time schedules up to two years if the dischargers demonstrate reasonable attempts to

secure funding for the Phase 1 studies but experience severe budget shortfalls.

Annually, staff shall publicly report to the Regional Water Board progress of upstream mercury program development, discharger and stakeholder coordination, Control Study Workplan status, implementation of Control Studies, actions implemented or proposed to meet load and waste load allocations, and the status of the formation and activities of the TAC.

By 20 October 2015, the Executive Officer shall provide a comprehensive report to the Regional Water Board on Phase 1 progress, including progress of upstream mercury control program development, Control Studies, actions implemented or proposed to meet Delta Mercury Control Program load and waste load allocations, and the status and progress of the TAC.

If dischargers do not comply with Control Study implementation schedules, the Executive Officer shall consider issuing individual waste discharge requirements or ordering the production of technical reports and/or management plans.

Phase 1 Delta Mercury Control Program Review

By 20 October 2020, at a public hearing, and after a scientific peer review and public review process, the Regional Water Board shall review the Delta Mercury Control Program and may consider modification of objectives, allocations, implementation provisions and schedules, and the Final Compliance Date.

If the Executive Officer allows an extension for the Control Studies' schedule, then the Delta Mercury Control Program Review may be delayed up to two years. If the Delta Mercury Control Program Review is delayed more than one year, the Regional Water Board should consider extending the schedule for Phase 2 implementation of methylmercury controls, and the Final Compliance Date.

The Regional Water Board shall assess: (a) the effectiveness, costs, potential environmental effects, and technical and economic feasibility of potential methylmercury control methods; (b) whether implementation of some control methods would have negative impacts on other project or activity benefits; (c) methods that can be employed to minimize or avoid potentially significant negative impacts to project or activity benefits that may result from control methods; (d) implementation plans and

schedules proposed by the dischargers; and (e) whether methylmercury allocations can be attained.

The Regional Water Board shall use any applicable new information and results of the Control Studies to adjust the relevant allocations and implementation requirements as appropriate. Interim limits established during Phase 1 and allocations will not be reduced as a result of early actions that result in reduced inorganic (total) mercury and/or methylmercury in discharges.

As part of the Phase 1 Delta Mercury Control Program Review and subsequent program reviews, the Regional Water Board may consider adjusting the allocations to allow methylmercury discharges from existing and new wetland restoration and other aquatic habitat enhancement projects if dischargers provide information that demonstrates that 1) all reasonable management practices to limit methylmercury discharges are being implemented and 2) implementing additional methylmercury management practices would negatively impact fish and wildlife habitat or other project benefits. The Regional Water Board will consider the merits of the project(s) and whether to require the discharger(s) to propose other activities in the watershed that could offset the methylmercury. The Regional Water Board will periodically review the progress towards achieving the allocations and may consider additional conditions if the plan described above is ineffective.

The Regional Water Board shall conduct the Phase 1 Delta Mercury Program Review based on information received in Phase 1. If the Regional Water Board does not receive timely information to review and update the Delta Mercury Control Program, then allocations shall not be raised but may be lowered and the 2030 Final Compliance Date shall not be changed for those individual dischargers who did not complete the Phase 1 requirements.

The Regional Water Board shall require implementation of appropriate management practices. The methylmercury management plan(s) developed in Phase 1 shall be initiated as soon as possible, but no later than one (1) year after Phase 2 begins.

The Regional Water Board shall review this control program two years prior to the end of Phase 2, and at intervals no more than 10 years thereafter.

Compliance Monitoring

Within two years after the start of Phase 2, entities responsible for meeting load and waste load allocations shall monitor methylmercury loads and concentrations and submit annual reports to the Regional Water Board. The points of compliance for waste load allocations for NPDES facilities shall be the effluent monitoring points described in individual NPDES permits. The points of compliance for MS4s required to conduct methylmercury monitoring are those locations described in the individual MS4 NPDES permits or otherwise determined to be representative of the MS4 service areas and approved by the Executive Officer on an MS4-specific basis. The points of compliance and monitoring plans for non-point sources shall be determined during the Control Studies. Compliance with the load allocations for nonpoint sources and waste load allocations for MS4s may be documented by monitoring methylmercury loads at the compliance points or by quantifying the annual average methylmercury load reduced by implementing pollution prevention activities and source and treatment controls.

Entities will be allowed to comply with their mercury receiving water monitoring requirements by participating in a regional monitoring program, when such a program is implemented.

Chapter V, Surveillance and Monitoring, contains additional monitoring guidance.

Requirements for State and Federal Agencies

Open water allocations are assigned jointly to the State Lands Commission, the Department of Water Resources, and the Central Valley Flood Protection Board as applicable. Other agencies that are identified in Phase 1 that implement actions and activities that have the potential to contribute to methylmercury production and loss in open water will be required to take part in the studies. In the Phase 1 review, the Regional Water Board will modify, as appropriate, the list of entities that are responsible for meeting the open water allocations. Open water allocations apply to the methylmercury load that fluxes to the water column from sediments in open-water habitats within channels and floodplains in the Delta and Yolo Bypass.

The State Lands Commission, Central Valley Flood Protection Board, Department of Water Resources, and other identified agencies shall conduct Control Studies and evaluate options to reduce methylmercury in open waters under jurisdiction of the State Lands Commission and floodplain areas

inundated by flood flows. These agencies shall evaluate their activities to determine whether operational changes or other practices or strategies could be implemented to reduce ambient methylmercury concentrations in Delta open water areas and floodplain areas inundated by managed floodplain flows. Evaluations shall include inorganic mercury reduction projects. By 20 April 2012, these agencies shall demonstrate how the agencies have secured adequate resources to fund the Control Studies. Regional Water Board staff will work with the agencies to develop the Control Studies and evaluate potential mercury and methylmercury reduction actions.

Activities including water management and impoundment in the Delta and Yolo Bypass, maintenance of and changes to salinity objectives, dredging and dredge materials disposal and reuse, and management of flood conveyance flows are subject to the open water methylmercury allocations. Agencies responsible for these activities in the Delta and Yolo Bypass include, but are not limited to, Department of Water Resources, State Lands Commission, Central Valley Flood Protection Board, U.S. Bureau of Reclamation, U.S. Army Corps of Engineers (USACE), and the State Water Resources Control Board. Control Studies shall be completed for the activities that have the potential to increase ambient methylmercury levels. These agencies may conduct their own coordinated Control Studies or may work with the other stakeholders in comprehensive, coordinated Control Studies.

The agencies should coordinate with wetland and agricultural landowners during Phase 1 to characterize existing methylmercury discharges to open waters from lands immersed by managed flood flows and develop methylmercury control measures.

New wetland, floodplain, and other aquatic habitat restoration and enhancement projects, including but not limited to projects developed, planned, funded, or approved by individuals, private businesses, non-profit organizations, and local, State, and federal agencies such as USACE, U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration Fisheries, U.S. Environmental Protection Agency, U.S. Bureau of Reclamation, State Water Resources Control Board, California Department of Water Resources, and California Department of Fish and Game, shall comply with all applicable requirements of this program, including conducting or participating in Control Studies and complying with allocations. To the

extent allowable by their regulatory authority, Federal, State, and local agencies that fund, approve, or implement such new projects shall direct project applicants/grantees/loanees to apply to or consult with the Regional Water Board to ensure full compliance with the water quality requirements herein.

Dredging and Dredge Material Reuse

Dredging activities and activities that reuse dredge material in the Delta should minimize increases in methyl and total mercury discharges to Delta waterways (Appendix 43). The following requirements apply to dredging and excavating projects in the Delta and Yolo Bypass where a Clean Water Act 401 Water Quality Certification or other waste discharge requirements are required. The Clean Water Act 401 Water Quality Certifications shall include the following conditions:

1. Employ management practices during and after dredging activities to minimize sediment releases into the water column.
2. Ensure that under normal operational circumstances, including during wet weather, dredged and excavated material reused at upland sites, including the tops and dry-side of levees, is protected from erosion into open waters.

In addition to the above requirements, the following requirements apply to the California Department of Water Resources, USACE, the Port of Sacramento, the Port of Stockton, and other State and federal agencies conducting dredging and excavating projects in the Delta and Yolo Bypass:

1. Characterize the total mercury mass and concentration of material removed from Delta waterways (Appendix 43) by dredging activities.
2. Conduct monitoring and studies to evaluate management practices to minimize methylmercury discharges from dredge return flows and dredge material reuse sites. Agencies shall:
 - By 20 October 2013, project proponents shall submit a study workplan(s) to evaluate methylmercury and mercury discharges from dredging and dredge material reuse, and to develop and evaluate management practices to

minimize increases in methyl and total mercury discharges. The proponents may submit a comprehensive study workplan rather than conduct studies for individual projects. The comprehensive workplan may include exemptions for small projects. Upon Executive Officer approval, the plan shall be implemented.

- By 20 October 2018, final reports that present the results and descriptions of mercury and methylmercury control management practices shall be submitted to the Regional Water Board.

Studies should be designed to achieve the following aims for all dredging and dredge material reuse projects. When dredge material disposal sites are utilized to settle out solids and return waters are discharged into the adjacent surface water, methylmercury concentrations in return flows should be equal to or less than concentrations in the receiving water. When dredge material is reused at aquatic locations, such as wetland and riparian habitat restoration sites, the reuse should not add mercury-enriched sediment to the site or result in a net increase of methylmercury discharges from the reuse site.

The results of the management practices studies should be applied to future projects.

Cache Creek Settling Basin Improvement Plan and Schedule

Department of Water Resources, Central Valley Flood Protection Board, and USACE, in conjunction with any landowners and other interested stakeholders, shall implement a plan for management of mercury contaminated sediment that has entered and continues to enter the Cache Creek Settling Basin (Basin) from the upstream Cache Creek watershed. The agencies shall:

1. By 20 October 2012, the agencies shall take all necessary actions to initiate the process for Congressional authorization to modify the Basin, or other actions as appropriate, including coordinating with the USACE.

2. By 20 October 2013, the agencies shall develop a strategy to reduce total mercury from the Basin for the next 20 years. The strategy shall include a description of, and schedule for, potential studies and control alternatives, and an evaluation of funding options. The agencies shall work with the landowners within the Basin and local communities affected by Basin improvements.
3. By 20 October 2015, the agencies shall submit a report describing the long term environmental benefits and costs of sustaining the Basin's mercury trapping abilities indefinitely.
4. By 20 October 2015, the agencies shall submit a report that evaluates the trapping efficiency of the Cache Creek Settling Basin and proposes, evaluates, and recommends potentially feasible alternative(s) for mercury reduction from the Basin. The report shall evaluate the feasibility of decreasing mercury loads from the basin, up to and including a 50% reduction from existing loads.
5. By 20 October 2017, the agencies shall submit a detailed plan for improvements to the Basin to decrease mercury loads from the Basin.

The agencies shall submit the strategy and planning documents described above to the Regional Water Board for approval by the Executive Officer. During Phase 1, the agencies should consider implementing actions to reduce mercury loads from the Basin. Beginning in Phase 2, the agencies shall implement a mercury reduction plan.

Tributary Watersheds

Table IV-7D identifies methylmercury allocations for tributary inputs to the Delta and Yolo Bypass.

The sum total of 20-year average total mercury loads from the tributary watersheds identified in Table IV-7D needs to be reduced by 110 kg/yr. Initial reduction efforts should focus on watersheds that contribute the most mercury-contaminated sediment to the Delta and Yolo Bypass, such as the Cache Creek, American River, Putah Creek, Cosumnes River, and Feather River watersheds.

Future mercury control programs will address the tributary watershed methylmercury allocations and total mercury load reductions assigned to tributary

inputs to the Delta and Yolo Bypass. Additional methylmercury and total mercury load reductions may be required within those watersheds to address any mercury impairment within those watersheds.

Mercury control programs will be developed for tributary inputs to the Delta by the following dates:

- 2012: American River;
- 2016: Feather, Sacramento, San Joaquin, and Mokelumne Rivers, and Marsh and Putah Creeks; and
- 2017: Cosumnes River and Morrison Creek.

Mercury Offsets

The intent of an offset program is to optimize limited resources to maximize environmental benefits. The overall objectives for an offset program are to (1) provide more flexibility than the current regulatory system provides to improve the environment while meeting regulatory requirements (i.e., load and wasteload allocations) at a lower overall cost and (2) promote watershed-based initiatives that encourage earlier and larger load reductions to the Delta than would otherwise occur.

On or before 20 October 2020, the Regional Water Board will consider adoption of a mercury (inorganic and/or methyl) offsets program. During Phase 1, stakeholders may propose pilot offset projects for public review and Regional Water Board approval. The offsets program and any Phase 1 pilot offset projects shall be based on the following key principles:

- Offsets shall be consistent with existing USEPA and State Board policies and with the assumptions and requirements upon which this and other mercury control programs are established.
- Offsets should not include requirements that would leverage existing discharges as a means of forcing dischargers to bear more than their fair share of responsibility for causing or contributing to any violation of water quality standards. In this context "fair share" refers to the dischargers' proportional contribution of methylmercury load.
- Offset credits should only be available to fulfill a discharger's responsibility to meet its (waste) load allocation after reasonable load reduction and pollution prevention strategies have been implemented.
- Offsets should not be allowed in cases where local human or wildlife communities bear a disparate or disproportionate pollution burden as a result of the offset.

- Offset credits should be available upon generation and last long enough (i.e., not expire quickly) to encourage feasible projects.
- Creditable load reductions achieved should be real, quantifiable, verifiable, and enforceable by the Regional Water Board.

Alternatives to direct load credits may be developed.

Exposure Reduction Program

While methylmercury and mercury source reductions are occurring, the Regional Water Board recognizes that activities should be undertaken to protect those people who eat Delta fish by reducing their methylmercury exposure and its potential health risks. The Exposure Reduction Program (ERP) is not intended to replace timely reduction of mercury and methylmercury loads to Delta waters.

The Regional Water Board will investigate ways, consistent with its regulatory authority, to address public health impacts of mercury in Delta fish, including activities that reduce actual and potential exposure of and mitigate health impacts to those people and communities most likely to be affected by mercury in Delta caught fish, such as subsistence fishers and their families (State Water Board Resolution No. 2005-0060).

By 20 October 2012, Regional Water Board staff shall work with dischargers (either directly or through their representatives), State and local public health agencies (including California Department of Public Health, California Office of Health Hazard Assessment, and county public health and/or environmental health departments), and other stakeholders, including community-based organizations, tribes, and Delta fish consumers, to complete an Exposure Reduction Strategy. The purposes of the Strategy will be to recommend to the Executive Officer how dischargers will be responsible for participating in an ERP, to set performance measures, and to propose a collaborative process for developing, funding and implementing the program. The Strategy shall take into account the proportional share of methylmercury contributed by individual dischargers. If dischargers (either directly or through their representatives) do not participate in the collaborative effort to develop the ERP, the Regional Water Board will evaluate and implement strategies, consistent with the Regional Water Board's regulatory authority, to assure participation from all dischargers or their representatives.

The objective of the Exposure Reduction Program is to reduce mercury exposure of Delta fish consumers most likely affected by mercury.

The Exposure Reduction Program must include elements directed toward:

- Developing and implementing community-driven activities to reduce mercury exposure;
- Raising awareness of fish contamination issues among people and communities most likely affected by mercury in Delta-caught fish such as subsistence fishers and their families;
- Integrating community-based organizations that serve Delta fish consumers, tribes, and public health agencies in the design and implementation of an exposure reduction program;
- Identifying resources, as needed, for community-based organizations and tribes to participate in the Program;
- Utilizing and expanding upon existing programs and materials or activities in place to reduce mercury, and as needed, create new materials or activities; and
- Developing measures for program effectiveness.

The dischargers, either individually or collectively, or based on the Exposure Reduction Strategy, shall submit an exposure reduction workplan for Executive Officer approval by 20 October 2013. The workplan shall address the Exposure Reduction Program objective, elements, and dischargers' coordination with other stakeholders. Dischargers shall integrate or, at a minimum, provide good-faith opportunities for integration of community-based organizations, tribes, and consumers of Delta fish into planning, decision making, and implementation of exposure reduction activities.

The dischargers shall implement the workplan by six months after Executive Officer approval of workplan. Every three years after workplan implementation begins, the dischargers, individually or collectively, shall provide a progress report to the Executive Officer. Dischargers shall participate in the Exposure Reduction Program until they comply with all requirements related to their individual or subarea methylmercury allocation.

The California Department of Public Health, the California Office of Environmental Health Hazard Assessment, and the local county public health and/or environmental health departments should collaborate with dischargers and community and tribal members to develop and implement exposure

reduction programs and provide guidance to dischargers and others that are conducting such activities. The California Department of Public Health and/or other appropriate agency should seek funds to contribute to the Exposure Reduction Program and to continue it beyond 2030, if needed, until fish tissue objectives are attained.

The State Water Board should develop a statewide policy that defines the authority and provides guidance for exposure reduction programs, including guidance on addressing public health impacts of mercury, activities that reduce actual and potential exposure of, and mitigating health impacts to those people and communities most likely to be affected by mercury.

Exceptions for Low Threat Discharges

Discharges subject to a waiver of waste discharge requirements based on a finding that the discharges pose a low threat to water quality, except for discharges subject to water quality certifications, are exempt from the mercury requirements of this Delta Mercury Control Program.

Discharges subject to waste discharge requirements for dewatering and other low threat discharges to surface waters are exempt from the mercury requirements of this Delta Mercury Control Program.

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Table IV-7A

Methylmercury Load and Waste load Allocations for Each Delta Subarea by Source Category

Source Type	DELTA SUBAREA													
	Central Delta		Marsh Creek		Mokelumne River		Sacramento River		San Joaquin River		West Delta		Yolo Bypass	
	Current Load (g/yr)	Allocation (g/yr)	Current Load (g/yr)	Allocation (g/yr)	Current Load (g/yr)	Allocation (g/yr)	Current Load (g/yr)	Allocation (g/yr)	Current Load (g/yr)	Allocation (g/yr)	Current Load (g/yr)	Allocation (g/yr)	Current Load (g/yr)	Allocation (g/yr)
Methylmercury Load Allocations														
Agricultural drainage ^(d)	37	37	2.2	0.4	1.6	0.57	36	20	23	8.3	4.1	4.1	19	4.1
Atmospheric wet deposition	7.3	7.3	0.23	0.23	0.29	0.29	5.6	5.6	2.7	2.7	2.4	2.4	4.2	4.2
Open water	370	370	0.18	0.032	4	1.4	140	78	48	17	190	190	100	22
Tributary Inputs ^(a)	37	37	1.9	0.34	110	39	2,034	1,129	367	133			462	100
Inputs from Upstream Subareas	(b)	(b)	---	---	---	---	---	---	---	---	(b)	(b)	---	---
Urban (nonpoint source)	0.14	0.14	---	---	0.018	0.018	0.62	0.62	0.0022	0.0022	0.066	0.066	---	---
Wetlands ^(d)	210	210	0.34	0.061	30	11	94	52	43	16	130	130	480	103
Methylmercury Waste Load Allocations														
NPDES facilities ^(a)	1.3	1.3	0.086	0.086	0	0	162	90	40	15	0.0019	0.0019	1	0.42
NPDES facilities future growth ^(a)	---	0.32 ^(b)	---	0.21	---	0	---	8.6	---	2.1	---	0.25 ^(b)	---	0.6
NPDES MS4 ^(a)	5.4	5.4	1.2	0.3	0.045	0.016	2.8	1.6	4.8	1.7	3.2	3.2	1.5	0.38
Total Loads^(c) (g/yr)	668	668	6.14	1.66	146	52.6	2,475	1,385	528	195	330	330	1,068	235

Table IV-7A Footnotes:

- (a) Values shown for Tributary Inputs, NPDES Facilities, NPDES Facilities Future Growth, and NPDES MS4 represent the sum of several individual discharges. See Tables IV-7B, IV-7C, and IV-7D for allocations for the individual discharges that should be used for compliance purposes.
- (b) The Central Delta subarea receives flows from the Sacramento, Yolo Bypass, Mokelumne, and San Joaquin subareas. The West Delta subarea receives flows from the Central Delta and Marsh Creek subareas. These within-Delta flows have not yet been quantified because additional data are needed for loss rates across the subareas. Federal and state agencies whose activities affect methylmercury loss and production processes in the Delta and Yolo Bypass are assigned joint responsibility for the open water allocation. These subarea inflows are expected to decrease substantially (e.g., 40-80%) as upstream mercury management practices take place. As a result, reductions for sources within the Central and West subareas and tributaries that drain directly to these subareas are not required.
- (c) For each Delta subarea, the allocations in Table IV-7A for agricultural drainage, atmospheric wet deposition, open water, urban (nonpoint source), and wetlands plus the individual allocations for tributary inputs (Table IV-7D), NPDES facilities and NPDES facilities future growth (Table IV-7B), and NPDES MS4 (Table IV-7C) within that subarea equal the Delta subarea's TMDL (assimilative capacity).
- (d) The load allocations apply to the net methylmercury loads, where the net loads equal the methylmercury load in outflow minus the methylmercury loads in source water (e.g., irrigation water and precipitation).

TABLE IV-7B
MUNICIPAL AND INDUSTRIAL WASTEWATER METHYLMERCURY (MeHg) ALLOCATIONS

PERMITTEE ^(a)	NPDES Permit No.	MeHg Waste Load Allocation ^(b) (g/yr)
Central Delta		
Discovery Bay WWTP	CA0078590	0.37
Lincoln Center Groundwater Treatment Facility	CA008255	0.018
Lodi White Slough WWTP	CA0079243	0.94
Metropolitan Stevedore Company	CA0084174	^(c)
Unassigned allocation for NPDES facility discharges	^(d)	0.31
Marsh Creek		
Brentwood WWTP	CA0082660	0.14
Unassigned allocation for NPDES facility discharges	^(d)	0.16
Sacramento River		
Rio Vista Northwest WWTP	CA0083771	0.069
Rio Vista WWTP	CA0079588	0.056
Sacramento Combined WWTP	CA0079111	0.53
SRCSA Sacramento River WWTP	CA0077682	89
Unassigned allocation for NPDES facility discharges	^(d)	8.5
San Joaquin River		
Deuel Vocational Inst. WWTP	CA0078093	0.021
Manteca WWTP	CA0081558	0.38
Mountain House Community Services District WWTP	CA0084271	0.37
Oakwood Lake Subdivision Mining Reclamation ^(f)	CA0082783	0.38 ^(f)
Stockton WWTP	CA0079138	13
Tracy WWTP	CA0079154	0.77
Unassigned allocation for NPDES facility discharges	^(d)	1.7
West Delta		
GWF Power Systems ^(e)	CA0082309	0.0052
Mirant Delta LLC Contra Costa Power Plant	CA0004863	^(e)
Ironhouse Sanitation District	CA0085260	0.030
Unassigned allocation for NPDES facility discharges	^(d)	0.22
Yolo Bypass		
Davis WWTP ^(g)	CA0079049	0.17 ^(g)
Woodland WWTP	CA0077950	0.43
Unassigned allocation for NPDES facility discharges	^(d)	0.42

Table IV-7B Footnotes:

- (a) If NPDES facilities that have allocations in Table IV-7B regionalize or consolidate, their waste load allocations can be summed.
- (b) Methylmercury waste load allocations apply to annual (calendar year) discharge methylmercury loads.
- (c) A methylmercury waste load allocation for non-storm water discharges from the Metropolitan Stevedore Company (CA0084174) shall be established in its NPDES permit once it completes three sampling events for methylmercury in its discharges. Its waste load allocation is a component of the “Unassigned Allocation” for the Central Delta subarea.
- (d) Table IV-7B contains unassigned waste load allocations for new discharges to surface water that begin after 20 October 2011. New discharges that may be allotted a portion of the unassigned allocation may come from (1) existing facilities that previously discharged to land and then began to discharge to surface water or diverted discharges to another facility that discharges to surface water as part of ongoing regionalization efforts; (2) newly built facilities that have not previously discharged to land or water; and (3) expansions to existing facilities beyond their allocations listed in Table IV-7B where the additional allocation does not exceed the product of the net increase in flow volume and 0.06 ng/l methylmercury. The sum of all new and/or expanded methylmercury discharges from NPDES facilities within each Delta subarea shall not exceed the Delta subarea-specific waste load allocation listed in Table IV-7B.
- (e) Methylmercury loads and concentrations in heating/cooling and power facility discharges vary with intake water conditions. To determine compliance with the allocations, dischargers that use ambient surface water for cooling water shall conduct concurrent monitoring of the intake water and effluent. The methylmercury allocations for such heating/cooling and power facility discharges are 100%, such that the allocations shall become the detected methylmercury concentration found in the intake water. GWF Power Systems (CA0082309) acquires its intake water from sources other than ambient surface water and therefore has a methylmercury allocation based on its effluent methylmercury load.
- (f) The waste load allocation for the Oakwood Lake Subdivision Mining Reclamation (CA0082783) shall be assessed as a five-year average annual methylmercury load.
- (g) The City of Davis WWTP (CA0079049) has two discharge locations; wastewater is discharged from Discharge 001 to the Willow Slough Bypass upstream of the Yolo Bypass and from Discharge 002 to the Conaway Ranch Toe Drain in the Yolo Bypass. The methylmercury load allocation listed in Table IV-7B applies only to Discharge 002, which discharges seasonally from about February to June. Discharge 001 is encompassed by the Willow Slough watershed methylmercury allocation listed in Table D.

**TABLE IV-7C
MS4 METHYLMERCURY (MeHg) WASTE LOAD ALLOCATIONS
FOR URBAN RUNOFF WITHIN EACH DELTA SUBAREA**

Permittee	NPDES Permit No.	MeHg Waste Load Allocation ^(a, b) (g/yr)
Central Delta		
Contra Costa (County of) ^(c)	CAS083313	0.75
Lodi (City of)	CAS000004	0.053
Port of Stockton MS4	CAS084077	0.39
San Joaquin (County of)	CAS000004	0.57
Stockton Area MS4	CAS083470	3.6
Marsh Creek		
Contra Costa (County of) ^(c)	CAS083313	0.30
Mokelumne River		
San Joaquin (County of)	CAS000004	0.016
Sacramento River		
Rio Vista (City of)	CAS000004	0.0078
Sacramento Area MS4	CAS082597	1.0
San Joaquin (County of)	CAS000004	0.11
Solano (County of)	CAS000004	0.041
West Sacramento (City of)	CAS000004	0.36
Yolo (County of)	CAS000004	0.041
San Joaquin River		
Lathrop (City of)	CAS000004	0.097
Port of Stockton MS4	CAS084077	0.0036
San Joaquin (County of)	CAS000004	0.79
Stockton Area MS4	CAS083470	0.18
Tracy (City of)	CAS000004	0.65
West Delta		
Contra Costa (County of) ^(c)	CAS083313	3.2
Yolo Bypass		
Solano (County of)	CAS000004	0.021
West Sacramento (City of)	CAS000004	0.28
Yolo (County of)	CAS000004	0.083

Table IV-7C Footnotes:

- (a) Some MS4s service areas span multiple Delta subareas and are therefore listed more than once. The allocated methylmercury loads for all MS4s are based on the average methylmercury concentrations observed in runoff from urban areas in or near the Delta during water years 2000 through 2003, a relatively dry period. Annual loads are expected to fluctuate with water volume and other factors. As a result, attainment of these allocations shall be assessed as a five-year average annual load. Allocations may be revised during review of the Delta Mercury Control Program to include available wet year data.
- (b) The methylmercury waste load allocations include all current and future permitted urban discharges not otherwise addressed by another allocation within the geographic boundaries of urban runoff management agencies within the Delta and Yolo Bypass, including but not limited to Caltrans facilities and rights-of-way (NPDES No. CAS000003), public facilities, properties proximate to banks of waterways, industrial facilities, and construction sites.
- (c) The Contra Costa County MS4 discharges to both the Delta and San Francisco Bay. The above allocations apply only to the portions of the MS4 service area that discharge to the Delta within the Central Valley Water Quality Control Board's jurisdiction.

**TABLE IV-7D
 TRIBUTARY WATERSHED
 METHYLMERCURY (MeHg) ALLOCATIONS**

Tributary	MeHg Load Allocation ^(a) (g/yr)
Central Delta	
Bear Creek @ West Lane / Mosher Creek @ Morada Lane (sum of watershed loads)	11
Calaveras River @ railroad tracks u/s West Lane	26
Marsh Creek	
Marsh Creek @ Highway 4	0.34
Mokelumne River	
Mokelumne River @ Interstate 5	39.3 (39) ^(b)
Sacramento River	
Morrison Creek @ Franklin Boulevard	4.2
Sacramento River @ Freeport	1,125 (1,100) ^(b)
San Joaquin River	
French Camp Slough downstream of Airport Way	4.0
San Joaquin River @ Vernalis	129 (130) ^(b)
Yolo Bypass	
Cache Creek	30 ^(c)
Dixon Area	0.77
Fremont Weir	39
Knights Landing Ridge Cut	22
Putah Creek @ Mace Boulevard	2.4
Ulatis Creek near Main Prairie Road	2.1
Willow Slough	3.9

Table IV-7D Footnotes:

- (a) Methylmercury allocations are assigned to tributary inputs to the Delta and Yolo Bypass. Mercury control programs designed to achieve the allocations for tributaries listed in Table IV-7D will be implemented by future Basin Plan amendments. Methylmercury load allocations are based on water years 2000 through 2003, a relative dry period. Annual loads are expected to fluctuate with water volume and other factors. As a result, attainment of these allocations shall be assessed as a five-year average annual load. Allocations will be revised during review of the Delta Mercury Control Program to include available wet year data.
- (b) Tributary load allocations rounded to two significant figures for compliance evaluation.
- (c) The allocation for water from Cache Creek entering the Yolo Bypass in this table is designed to achieve fish tissue objectives in the Yolo Bypass and Delta established by the Delta Mercury Control Program. The allocation in Table IV-6.1 assigned by the Cache Creek Mercury Control Program applies to the Cache Creek Settling Basin and requires a greater reduction so that fish within the Settling Basin can achieve water quality objectives for methylmercury in fish tissue that apply to Cache Creek, including the Settling Basin.

Pesticide Discharges from Nonpoint Sources

The control of pesticide discharges to surface waters from nonpoint sources will be achieved primarily by the development and implementation of management practices that minimize or eliminate the amount discharged. The Board will use water quality monitoring results to evaluate the effectiveness of control efforts and to help prioritize control efforts.

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for the prohibition is approximately \$37 million dollars per year to eliminate the impairment through provision of purchased water. The cost of construction of an aeration device of adequate capacity to eliminate the impairment, in conjunction with point source load reductions already required, is estimated to be \$10 million, with yearly operation and maintenance costs of \$200,000 per year.

Potential funding sources:

1. Proposition 13 includes \$40 million in bond funds to address the dissolved oxygen impairment in the DWSC. Approximately \$14.4 million of this \$40 million has been identified to fund the oxygen demanding substance and precursor studies. An additional \$1.2 million is being provided from various watershed stakeholders. Approximately \$24 million of Proposition 13 funds are available to pay for projects such as the design and construction of an aeration device.
2. The State Water Contractors, Port of Stockton, San Luis and Delta Mendota Water Authority, San Joaquin Valley Drainage Authority, and the San Joaquin River Group Authority have proposed to develop an operating entity for an aeration device and have indicated their commitment to execute a funding agreement among themselves and other interested parties, (subject to ultimate approval of respective governing boards) that would provide the mechanism to support operation of a permanent aerator at a cost expected to be in the annual range of \$250,000 to \$400,000.

Diazinon and Chlorpyrifos Runoff into the San Joaquin River Control Program

The total estimated costs for management practices to meet the diazinon and chlorpyrifos objectives for the San Joaquin River range from \$56,000 to \$2.5 million for the dormant season, and from \$3.9 million to \$5.3 million for the irrigation season. The estimated costs for discharger compliance monitoring, planning and evaluation range from \$600,000 to \$3.1 million. The estimated total annual costs range from \$4.4 million to \$10.9 million (2004 dollars).

Potential funding sources include:

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

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

The total estimated costs for management practices to meet the diazinon and chlorpyrifos objectives for the Delta Waterways range from \$5.9 to \$12.7 million. The estimated costs for discharger compliance monitoring, planning and evaluation range from \$600,000 to \$1.8 million. The estimated total annual costs range from \$6.5 to \$14.4 million (2005 dollars).

Potential funding sources include:

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

Clear Lake Nutrient Control Program

Estimated costs to implement best management practices, if necessary, are \$400,000 to \$1,800,000 (2006 dollars).

Potential funding sources include:

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

Delta Mercury Control Program

The total estimated costs (2007 dollars) for the agricultural methylmercury control studies to develop management practices to meet the Delta methylmercury allocations range from \$290,000 to \$1.4 million. The estimated annual costs for agricultural discharger compliance monitoring range from \$14,000 to \$25,000. The estimated annual costs for Phase 2 implementation of methylmercury management practices range from \$590,000 to \$1.3 million.

1. Potential funding sources include those identified in the San Joaquin River Subsurface Agricultural Drainage Control Program and the Pesticide Control Program.

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.

Delta

Fish Methylmercury Compliance Monitoring

The Regional Water Board will use the following specifications to determine compliance with the methylmercury fish tissue objectives in the Sacramento-San Joaquin Delta. Beginning 2025, Regional Water Board staff will initiate fish tissue monitoring. Thereafter compliance monitoring will ensue every ten years, more frequently as needed where substantial changes in methyl or total mercury concentrations or loading occur, but not to exceed ten years elsewhere.

Initial fish tissue monitoring will take place at the following compliance reaches in each subarea:

- Central Delta subarea: Middle River between Bullfrog Landing and Mildred Island;
- Marsh Creek subarea: Marsh Creek from Highway 4 to Cypress Road;

- Mokelumne/Cosumnes River subarea: Mokelumne River from the Interstate 5 bridge to New Hope Landing;
- Sacramento River subarea: Sacramento River from River Mile 40 to River Mile 44;
- San Joaquin River subarea: San Joaquin River from Vernalis to the Highway 120 bridge;
- West Delta subarea: Sacramento/San Joaquin River confluence near Sherman Island;
- Yolo Bypass-North subarea: Tule Canal downstream of its confluence with Cache Creek; and
- Yolo Bypass-South subarea: Toe Drain between Lisbon and Little Holland Tract.

Compliance fish methylmercury monitoring will include representative fish species for comparison to each of the methylmercury fish tissue objectives:

- Trophic Level 4: bass (largemouth and striped), channel and white catfish, crappie, and Sacramento pikeminnow.
- Trophic Level 3: American shad, black bullhead, bluegill, carp, Chinook salmon, redear sunfish, Sacramento blackfish, Sacramento sucker, and white sturgeon.
- Small (<50 mm) fish: primary prey species consumed by wildlife in the Delta, which may include the species listed above, as well as inland silverside, juvenile bluegill, mosquitofish, red shiner, threadfin shad, or other fish less than 50 mm.

Trophic level 3 and 4 fish sample sets will include three species from each trophic level and will include both anadromous and non-anadromous fish. Trophic level 3 and 4 fish sample sets will include a range of fish sizes between 150 and 500 mm total length. Striped bass, largemouth bass, and sturgeon caught for mercury analysis will be within the CDFG legal catch size limits. Sample sets for fish less than 50 mm will include at least two fish species that are the primary prey species consumed by wildlife at sensitive life stages. In any subarea, if multiple species for a particular trophic level are not available, one species in the sample set is acceptable.

Water Methylmercury and Total Mercury Compliance Monitoring

Compliance points for irrigated agriculture and managed wetlands methylmercury allocations shall be developed during the Phase 1 Control Studies.

In conjunction with the Phase 1 Control Studies, nonpoint sources, irrigated agriculture, and managed wetlands shall develop and implement mercury and/or methylmercury monitoring, and submit monitoring reports.

NPDES facilities' compliance points for methylmercury and total mercury monitoring are the effluent monitoring points currently described in individual NPDES permits.

During Phase 1 and Phase 2, facilities listed in Table IV-7B shall conduct effluent total mercury and methylmercury monitoring starting by 20 October 2012. Monitoring frequencies shall be defined in the NPDES permits. Effluent monitoring requirements will be re-evaluated during the Delta Mercury Control Program Reviews.

Facilities that begin discharging to surface water during Phase 1 and facilities for which effluent methylmercury data were not available at the time Table IV-7B was compiled, shall conduct monitoring.

Compliance points and monitoring frequencies for MS4s required to conduct methylmercury and total mercury monitoring are those locations and wet and dry weather sampling periods currently described in the individual MS4 NPDES permits or otherwise determined to be representative of the MS4 service areas and approved by the Executive Officer on an MS4-specific basis.

Annual methylmercury loads in urban runoff in MS4 service areas within the Delta and Yolo Bypass may be calculated by the following method or by an alternate method approved by the Executive Officer. The annual methylmercury load in urban runoff for a given MS4 service area during a given year may be calculated by the sum of wet weather and dry weather methylmercury loads. To estimate wet weather methylmercury loads discharged by MS4 urban areas, the average of wet weather methylmercury concentrations observed at the MS4's compliance locations may be multiplied by the wet weather runoff volume estimated for all urban areas within the MS4 service area within the Delta and Yolo Bypass. To estimate dry weather methylmercury loads, the average of dry weather methylmercury concentrations observed at the MS4's compliance locations may be multiplied by the estimated dry weather urban runoff volume in the MS4 service area within the Delta and Yolo Bypass.

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;

APPENDIX

APPENDIX DIRECTORY

<u>ITEM*</u>	<u>DESCRIPTION</u>
1.	State Water Board Policy for Water Quality Control
2.	State Water Board Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality of Waters in California
3.	State Water Board Resolution No. 74-43, Water Quality Control Policy for the Enclosed Bays and Estuaries of California
4.	State Water Board Resolution No. 75-58, Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling
5.	State Water Board Resolution No. 77-1, Policy with Respect to Water Reclamation in California
6.	State Water Board Resolution No. 87-22, Policy on the Disposal of Shredder Waste
7.	State Water Board Resolution No. 88-23, Policy Regarding the Underground Storage Tank Pilot Program
8.	State Water Board Resolution No. 88-63, Sources of Drinking Water Policy
9.	State Water Board Resolution No. 92-49, Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304
10.	State Water Board Resolution No. 93-62, Policy for Regulation of Discharges of Municipal Solid Waste
11.	State Water Board Water Quality Control Plan for Temperature in Coastal and Inerstate Waters and Enclosed Bays and Estuaries in California (Thermal Plan)
12.	State Water Board Resolution No. 92-82, exception to the Thermal Plan for Sacramento Regional County Sanitation District
13.	State Water Board MAA with Forest Service, U. S. Department of Agriculture
14.	State Water Board MOA with Department of Health Services (implementation of hazardous waste program)
15.	State Water Board MOA with Department of Health Services (use of reclaimed water)
16.	State Water Board MAA with the Board of Forestry and California Department of Forestry and Fire Protection
17.	State Water Board MOA with CA Department of Conservation, Division of Oil and Gas

* Appendix items are paginated by: item number/item page/item total pages

APPENDIX DIRECTORY

<u>ITEM*</u>	<u>DESCRIPTION</u>
18.	State Water Board MOU with Department of Health Services/Department of Toxic Substances Control
19.	State Water Board MOU with Soil Conservation Service, U.S. Department of Agriculture for Planning and Technical Assistance Related to Water Quality Policies and Activities
20.	State Water Board MOU with the Environmental Affairs Agency, Air Resources Board, and California Integrated Waste Management Board
21.	State Water Board MOU with the California Department of Pesticide Regulation for the Protection of Water Quality from Potentially Adverse Effects of Pesticides
22.	State Water Board MOU with Several Agencies Regarding the Implementation of the San Joaquin Valley Drainage Program's Recommended Plan
23.	State Water Board MOU with the California Integrated Waste Management Board
24.	State Water Board MOU with the Bureau of Land Management US Department of Interior - Nonpoint Source Issues, Planning and Coordination of Nonpoint Source Water Quality Policies and Activities
25.	Regional Water Board Resolution No. 70-118, Delegation of Certain Duties and Powers of the Regional Water Board to the Board's Executive Officer
26.	Regional Water Board MOU with U.S. Bureau of Land Management (Ukiah District)
27.	Regional Water Board MOU with U.S. Bureau of Land Management (Susanville District)
28.	Regional Water Board MOU with U.S. Bureau of Land Management (Bakersfield District)
29.	Regional Water Board MOA with U. S. Bureau of Reclamation
30.	Regional Water Board MOU with California Dept. of Fish and Game and Mosquito Abatement and Vector Control Districts of the South San Joaquin Valley Regarding Vegetation Management in Wastewater Treatment Facilities
31.	Regional Water Board Resolution No. 89-247, Conditional Waiver of Waste Discharge Requirements at Retail Fertilizer Facilities - - - Removed 13 August 2009
32.	Regional Water Board Resolution No. 90-34, Conditional Waiver of Waste Discharge Requirements at Pesticide Applicator Facilities - - - Removed 13 August 2009

* Appendix items are paginated by: item number/item page/item total pages

APPENDIX DIRECTORY

<u>ITEM*</u>	<u>DESCRIPTION</u>
33.	Regional Water Board Guidelines for Winery Waste
34.	Regional Water Board Guidelines for Erosion
35.	Regional Water Board Guidelines for Small Hydroelectric Facilities
36.	Regional Water Board Guidelines for Disposal from Land Developments
37.	Regional Water Board Guidelines for Mining
38.	Regional Water Board list of Water Quality Limited Segments - - - Removed 6 September 2002
39.	Federal Anti-degradation policy (40 CFR 131.12)
40.	Grassland Watershed Wetland Channels
41.	San Joaquin Area Subarea Descriptions
42.	Sacramento-San Joaquin Delta Waterways
43.	Delta and Yolo Bypass Waterways Applicable to the Delta Mercury Control Program

* Appendix items are paginated by: item number/item page/item total pages

Appendix 43 - Delta and Yolo Bypass Waterways Applicable to the Delta Mercury Control Program

Table A43-1 lists the Sacramento-San Joaquin Delta waterways and the Yolo Bypass waterways within the Delta and north of the legal Delta boundary to which the COMM beneficial use, site-specific methylmercury fish tissue objectives, Delta mercury control implementation program, and monitoring provisions apply. The list contains distinct, readily identifiable water bodies within the boundaries of the “Legal” Delta (as defined in California Water Code section 12220) that are hydrologically connected by surface water flows (not including pumping) to the Sacramento and/or San Joaquin rivers. The list also includes Knights Landing Ridge Cut, Putah Creek, and Tule Canal in the Yolo Bypass north of the legal Delta boundary. Figures A43-1, A43-2, and A43-3 show the locations of these waterways.

The methylmercury allocations set forth in the Delta methylmercury control program are specific to Delta subareas, which are shown on Figure A43-4. Table A43-2 lists the waterways within each of the subareas.

TABLE A43-1: DELTA AND YOLO BYPASS WATERWAYS

Map Label # / Waterway Name	Map Label # / Waterway Name
1. Alamo Creek	44. Franks Tract
2. Babel Slough	45. French Camp Slough
3. Barker Slough	46. Georgiana Slough
4. Bear Creek	47. Grant Line Canal
5. Bear Slough	48. Grizzly Slough
6. Beaver Slough	49. Haas Slough
7. Big Break	50. Hastings Cut
8. Bishop Cut	51. Hog Slough
9. Black Slough	52. Holland Cut
10. Broad Slough	53. Honker Cut
11. Brushy Creek	54. Horseshoe Bend
12. Burns Cutoff	55. Indian Slough
13. Cabin Slough	56. Italian Slough
14. Cache Slough	57. Jackson Slough
15. Calaveras River	58. Kellogg Creek
16. Calhoun Cut	59. Latham Slough
17. Clifton Court Forebay	60. Liberty Cut
18. Columbia Cut	61. Lindsey Slough
19. Connection Slough	62. Little Connection Slough
20. Cosumnes River	63. Little Franks Tract
21. Crocker Cut	64. Little Mandeville Cut
22. Dead Dog Slough	65. Little Potato Slough
23. Dead Horse Cut	66. Little Venice Island
24. Deer Creek (Tributary to Marsh Creek)	67. Livermore Yacht Club
25. Delta Cross Channel	68. Lookout Slough
26. Disappointment Slough	69. Lost Slough
27. Discovery Bay	70. Main Canal (Duck Slough tributary)
28. Donlon Island	71. Main Canal (Italian Slough tributary)
29. Doughty Cut	72. Marsh Creek
30. Dry Creek (Marsh Creek tributary)	73. Mayberry Cut
31. Dry Creek (Mokelumne River tributary)	74. Mayberry Slough
32. Duck Slough	75. Middle River
33. Dutch Slough	76. Mildred Island
34. Elk Slough	77. Miner Slough
35. Elkhorn Slough	78. Mokelumne River
36. Emerson Slough	79. Mormon Slough
37. Empire Cut	80. Morrison Creek
38. Fabian and Bell Canal	81. Mosher Slough
39. False River	82. Mountain House Creek
40. Fisherman's Cut	83. North Canal
41. Fivemile Creek	84. North Fork Mokelumne River
42. Fivemile Slough	85. North Victoria Canal
43. Fourteenmile Slough	86. Old River

TABLE A43-1: DELTA AND YOLO BYPASS WATERWAYS, *Continued*

Map Label # / Waterway Name	Map Label # / Waterway Name
87. Paradise Cut	120. The Big Ditch
88. Piper Slough	121. The Meadows Slough
89. Pixley Slough	122. Three River Reach
90. Potato Slough	123. Threemile Slough
91. Prospect Slough	124. Toe Drain
92. Red Bridge Slough	125. Tom Paine Slough
93. Rhode Island	126. Tomato Slough
94. Rock Slough	127. Trapper Slough
95. Sacramento Deep Water Channel	128. Turner Cut
96. Sacramento River	129. Ulatis Creek
97. Salmon Slough	130. Upland Canal (Sycamore Slough tributary)
98. San Joaquin River	131. Victoria Canal
99. Sand Creek	132. Walker Slough
100. Sand Mound Slough	133. Walthall Slough
101. Santa Fe Cut	134. Washington Cut
102. Sevenmile Slough	135. Werner Dredger Cut
103. Shag Slough	136. West Canal
104. Sheep Slough	137. Whiskey Slough
105. Sherman Lake	138. White Slough
106. Short Slough	139. Winchester Lake
107. Smith Canal	140. Woodward Canal
108. Snodgrass Slough	141. Wright Cut
109. South Fork Mokelumne River	142. Yosemite Lake
110. Steamboat Slough	143. Yolo Bypass
111. Stockton Deep Water Channel	144. Deuel Drain
112. Stone Lakes	145. Dredger Cut
113. Sugar Cut	146. Highline Canal
114. Sutter Slough	147. Cache Creek Settling Basin Outflow
115. Sweany Creek	148. Knights Landing Ridge Cut
116. Sycamore Slough	149. Putah Creek
117. Taylor Slough (Elkhorn Slough tributary)	150. Tule Canal
118. Taylor Slough (near Franks Tract)	
119. Telephone Cut	

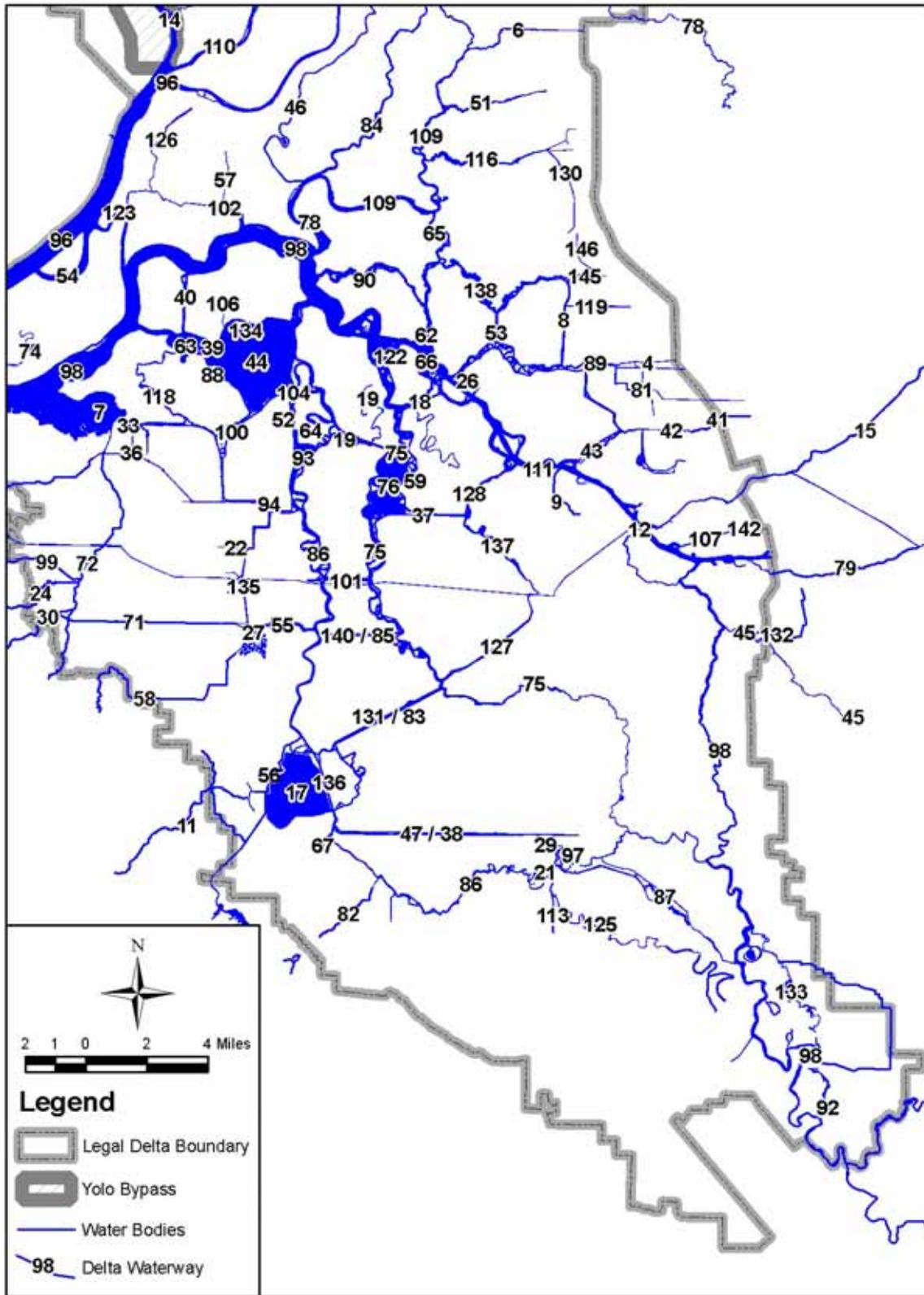


Figure A43-2: Delta Waterways (Southern Panel)

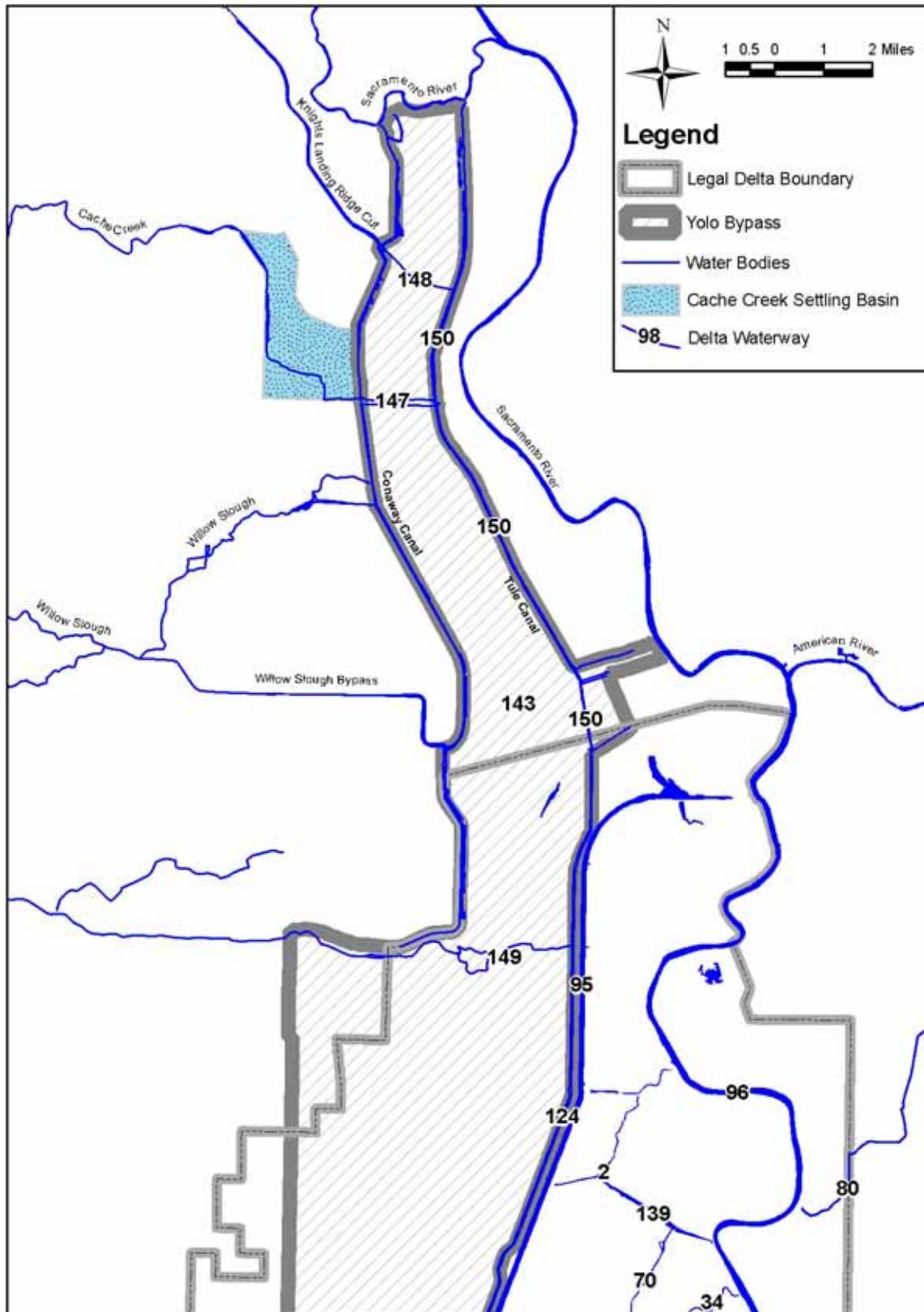


Figure A43-3: Northern Yolo Bypass

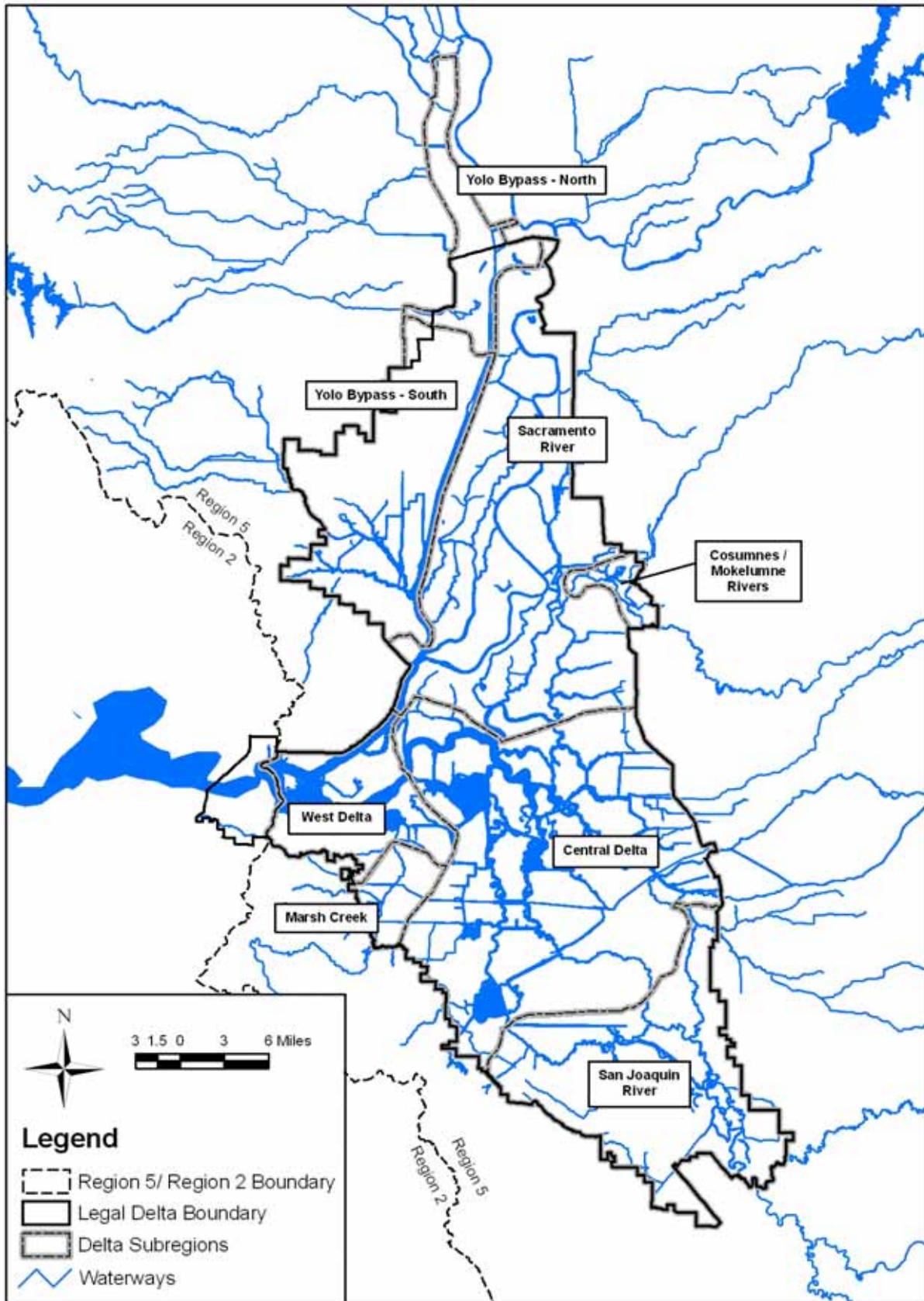


Figure A43-4: Subareas for the Delta Methylmercury Control Program

TABLE A43-2: DELTA AND YOLO BYPASS WATERWAYS BY METHYLMERCURY ALLOCATION SUBAREA

Waterway Name [Map Label #]	Waterway Name [Map Label #]	Waterway Name [Map Label #]
CENTRAL DELTA		
Bear Creek [4]	Indian Slough [55]	San Joaquin River [98]
Bishop Cut [8]	Italian Slough [56]	Sand Mound Slough [100]
Black Slough [9]	Jackson Slough [57]	Santa Fe Cut [101]
Brushy Creek [11]	Kellogg Creek [58]	Sevenmile Slough [102]
Burns Cutoff [12]	Latham Slough [59]	Sheep Slough [104]
Calaveras River [15]	Little Connection Slough [62]	Short Slough [106]
Clifton Court Forebay [17]	Little Franks Tract [63]	Smith Canal [107]
Columbia Cut [18]	Little Mandeville Cut [64]	Stockton Deep Water Channel [111]
Connection Slough [19]	Little Potato Slough [65]	Taylor Slough [nr Franks Tract] [118]
Dead Dog Slough [22]	Little Venice Island [66]	Telephone Cut [119]
Disappointment Slough [26]	Livermore Yacht Club [67]	Three River Reach [122]
Discovery Bay [27]	Main Canal [Indian Slough trib.] [71]	Threemile Slough [123]
Dredger Cut [145]	Middle River [75]	Tomato Slough [126]
Empire Cut [37]	Mildred Island [76]	Trapper Slough [127]
Fabian and Bell Canal [39]	Mokelumne River [78]	Turner Cut [128]
False River [39]	Mormon Slough [79]	Upland Canal [Sycamore Slough tributary] [130]
Fisherman's Cut [40]	Mosher Slough [81]	Victoria Canal [131]
Fivemile Creek [41]	North Canal [83]	Washington Cut [134]
Fivemile Slough [42]	North Victoria Canal [85]	Werner Dredger Cut [135]
Fourteenmile Slough [43]	Old River [86]	West Canal [136]
Franks Tract [44]	Piper Slough [88]	Whiskey Slough [137]
Grant Line Canal [47]	Pixley Slough [89]	White Slough [138]
Highline Canal [146]	Potato Slough [90]	Woodward Canal [140]
Holland Cut [52]	Rhode Island [93]	Yosemite Lake [142]
Honker Cut [53]	Rock Slough [94]	
MOKELUMNE/COSUMNES RIVERS		
Bear Slough [5]	Dry Creek [Mokelumne R. trib.] [31]	Lost Slough [69]
Cosumnes River [20]	Grizzly Slough [48]	Mokelumne River [78]
MARSH CREEK		
Deer Creek [24]	Main Canal [Indian Slough trib.] [71]	Rock Slough [94]
Dry Creek [Marsh Creek trib.] [30]	Marsh Creek [72]	Sand Creek [99]
Kellogg Creek [58]		
SACRAMENTO RIVER		
Babel Slough [2]	Little Potato Slough [65]	Stone Lakes [112]
Beaver Slough [6]	Lost Slough [69]	Sutter Slough [114]
Cache Slough [14]	Main Canal [Duck Slough trib.] [70]	Sycamore Slough [116]
Dead Horse Cut [23]	Miner Slough [77]	Taylor Slough [Elkhorn Slough tributary] [117]
Delta Cross Channel [25]	Mokelumne River [78]	The Meadows Slough [121]
Duck Slough [32]	Morrison Creek [80]	Tomato Slough [126]
Elk Slough [34]	North Mokelumne River [84]	Upland Canal [Sycamore Slough tributary] [130]
Elkhorn Slough [35]	Sacramento River [96]	Winchester Lake [139]
Georgiana Slough [46]	Snodgrass Slough [108]	
Hog Slough [51]	South Mokelumne River [109]	
Jackson Slough [57]	Steamboat Slough [110]	

**TABLE A43-2: DELTA AND YOLO BYPASS WATERWAYS BY METHYLMERCURY ALLOCATION
SUBAREA, *Continued***

Waterway Name [Map Label #]	Waterway Name [Map Label #]	Waterway Name [Map Label #]
SAN JOAQUIN RIVER		
Crocker Cut [21]	Middle River [75]	San Joaquin River [98]
Deuel Drain [144]	Mountain House Creek [82]	Sugar Cut [113]
Doughty Cut [29]	Old River [86]	Tom Paine Slough [125]
Fabian and Bell Canal [38]	Paradise Cut [87]	Walker Slough [132]
French Camp Slough [45]	Red Bridge Slough [92]	Walthall Slough [133]
Grant Line Canal [47]	Salmon Slough [97]	
WEST DELTA		
Big Break [7]	Horseshoe Bend [54]	San Joaquin River [98]
Broad Slough [10]	Marsh Creek [72]	Sand Mound Slough [100]
Cabin Slough [13]	Mayberry Cut [73]	Sherman Lake [105]
Donlon Island [28]	Mayberry Slough [74]	Taylor Slough [near Franks Tract] [118]
Dutch Slough [33]	Rock Slough [94]	Threemile Slough [123]
Emerson Slough [36]	Sacramento River [96]	
False River [39]		
YOLO BYPASS-NORTH ^(a)		
Cache Creek Settling Basin Outflow [147]	Toe Drain [124]/Tule Canal [150] Putah Creek [149]	Sacramento Deep Water Ship Channel [95]
Knights Landing Ridge Cut [148]		
YOLO BYPASS-SOUTH ^(a)		
Alamo Creek [1]	Liberty Cut [60]	Sweany Creek [115]
Babel Slough [2]	Lindsey Slough [61]	Sycamore Slough [116]
Barker Slough [3]	Lookout Slough [68]	The Big Ditch [120]
Cache Slough [14]	Miner Slough [77]	Toe Drain [124]
Calhoun Cut [16]	Prospect Slough [91]	Ulatis Creek [129]
Duck Slough [32]	Sacramento Deep Water Ship Channel [95]	Wright Cut [141]
Haas Slough [49]		
Hastings Cut [50]	Shag Slough [103]	

(a) Both the "Yolo Bypass-North" and "Yolo Bypass-South" subareas contain portions of the Yolo Bypass flood conveyance channel shown in Figure IV-4. When flooded, the entire Yolo Bypass is a Delta waterway. When the Yolo Bypass is not flooded, the Toe Drain [127] (referred to as Tule Canal [C] for its northern reach), Cache Creek Settling Basin Outflow [A], and Knights Landing Ridge Cut [B] are the only waterways within the Yolo Bypass hydrologically connected to the Sacramento River.