Appendix 7
Surface Water Quality

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APPENDIX 7A
California State Water Resources Control Board Constituents of Concern of Water Bodies in the Study Area

The Regional Water Quality Control Boards (RWQCBs) have adopted, and the California State Water Resources Control Board (SWRCB) has approved, water quality control plans (basin plans) for each watershed basin in the State. The basin plans designate the beneficial uses of waters within each watershed basin, and water quality objectives designed to protect those uses pursuant to Section 303 of the Clean Water Act (CWA). The beneficial uses together with the water quality objectives that are contained in the basin plans constitute State water quality standards.

Under the CWA section 303(d), the U.S. Environmental Protection Agency (USEPA) identifies and ranks water bodies for which existing pollution controls are insufficient to attain or maintain water quality standards based upon information prepared by all states, territories, and authorized Indian tribes (referred to collectively as "states" in the CWA). This list of impaired waters for each state comprises the state's 303(d) list. Each state must establish priority rankings and develop Total Maximum Daily Load (TMDL) values for all impaired waters. TMDLs calculate the greatest pollutant load that a water body can receive and still meet water quality standards and designated beneficial uses.

Section 305(b) of the CWA requires every state to submit a biennial water quality assessment of all state waters. These state-wide reports serve as the basis for USEPA's national Water Quality Inventory Report to Congress. Each water body is assessed regarding its ability to support the most common beneficial uses: aquatic life, drinking water supply, fish consumption, non-contact recreation, shell fishing, and swimming; also known as core beneficial uses. The USEPA requires states to integrate the 303(d) and 305(b) reports. For California, this report is called the California 303(d)/305(b) Integrated Report, and is prepared by the SWRCB using Integrated Reports submitted by each RWQCB.

The SWRCB and RWQCBs have identified numerous water bodies within the project area that do not comply with applicable water quality standards and either adopted or are developing TMDLs as summarized in Table 7A-1.

Table 7A-1
Constituents of Concern per the 303(d) list within the Study Area

Region	Waterbody	Constituent of Concern	TMDL Status[1]
Trinity and Lower Klamath Rivers	Trinity Lake (was Claire Engle Lake)	Mercury	Under Development
	Trinity River HU, Lower Trinity HA; Trinity River HU, Middle HA; Trinity River HU, South Fork HA; Trinity River, Upper HA; Trinity River HU, Upper HA, Trinity River, East Fork	Sedimentation/Siltation, Temperature[2], Mercury[3]	Approved: 2001
	Klamath River HU, Lower HA, Klamath Glen HAS	Nutrients, Organic, Enrichment/Low Dissolved Oxygen, Water Temperature	Approved: 2010
		Sedimentation/Siltation	Under Development
Sacramento River Basin	Shasta Lake (where West Squaw Creek Enters); Keswick Reservoir (portion downstream from Spring Creek); Spring Creek, Lower (Iron Mountain Mine to Keswick Reservoir)	Acid Mine Drainage[4], Cadmium, Copper, Zinc	Under Development
	Shasta Lake; Whiskeytown Lake (areas near Oak Bottom, Brandy Creek Campgrounds and Whiskeytown); Clear Creek (below Whiskeytown Lake, Shasta County)	Mercury	Under Development
	Sacramento River (Keswick Dam to the Delta)[5]	Unknown Toxicity, Chlordane[6], DDT, Mercury[7], PCBs, Dieldrin[8]	Under Development
	Big Chico Creek	Mercury	Under Development
	Black Butte Reservoir	Mercury	Under Development
	Butte Slough	Diazinon	Approved: 2010
		Dichlorvos, Dissolved Oxygen, and Unknown Toxicity	Under Development
	Stone Corral Creek	Dissolved Oxygen	Under Development
	East Park Reservoir	Mercury	Under Development
	Stony Creek	Chlorpyrifos, Diuron, Sediment Toxicity, Unknown Toxicity, pH	Under Development

Region	Waterbody	Constituent of Concern	TMDL Status[1]
Sacramento River Basin (cont'd)	Colusa Basin Drain	Diazinon, Malathion, Azinphos-methyl (Guthion), Group A Pesticides, Unknown Toxicity, DDT, Dieldrin, E. coli, Low Dissolved Oxygen, Mercury, Carbofuran	Under Development
	Sutter Bypass	Mercury	Under Development
	Oroville Lake; Feather River, Lower (Lake Oroville Dam and Thermalito Afterbay to Confluence with Sacramento River), Yuba River, Lower[9]	Group A Pesticides, Chlorpyrifos, Unknown Toxicity, Mercury, PCBs	Under Development
	Folsom Lake; Natoma, Lake; American River, Lower (Nimbus Dam to confluence with Sacramento River)[10]	Mercury, Unknown Toxicity, PCBs	Under Development
	Knights Landing Ridge Cut	Boron, Dissolved Oxygen, Salinity	Under Development
	Putah Creek	Boron, Mercury	Under Development
	Cache Creek, Lower (Clear Lake Dam to Cache Creek Settling Basin near Yolo Bypass)	Mercury	Approved: 2007
		Boron, Unknown Toxicity	Under Development
	Yolo Bypass – Tule Canal	Boron, *Escheria coliform*, salinity	Under Development
San Joaquin River and Tulare Basins	Mendota Pool; Panoche Creek (Silver Creek to Belmont Avenue)	Mercury,[11] Selenium, Sediment Toxicity[12], Sedimentation Siltation[12]	Under Development
	Agatha Canal (Merced County); Grasslands Marshes; Mud Slough, North (downstream of San Luis Drain); Salt Slough (upstream from confluence with San Joaquin River)[13]	Selenium[14]	Approved: 2002
		Chlorpyrifos	Approved: 2008
		Boron, Electrical Conductivity, Pesticides, Unknown Toxicity,[15] *Escherichia coli*, Mercury, pH, Prometryn	Under Development
	San Luis Reservoir and O'Neil Forebay	Mercury	Under Development
	Millerton Lake; San Joaquin River (Friant Dam to Stanislaus River)[16]	Selenium[17, 18]	Approved: 2002
		Chlorpyrifos, Diazinon[19]	Approved: 2007

Region	Waterbody	Constituent of Concern	TMDL Status[1]
San Joaquin River and Tulare Basins (cont'd)	See above	DDE20, DDT, Group A Pesticides, Boron[21], Invasive Species[23], Unknown Toxicity, Arsenic[24], Electrical Conductivity[18, 22], Mercury[18], Water Temperature,[26] alpha-BHC[20], *Escherichia coli*[18, 25]	Under Development
	San Joaquin River (Stanislaus River to Delta Boundary)	Chlorpyrifos, Electrical Conductivity	Approved: 2007
		DDE, DDT, Group A Pesticides, Mercury, Toxaphene, Unknown Toxicity, Diuron, *Escherichia coli*, Water Temperature	Under Development
	Merced River, Lower; Tuolumne River, Lower; New Melones Reservoir; Tulloch Reservoir; Stanislaus River, Lower[27]	Diazinon, Group A Pesticides, Chlorpyrifos, Mercury, Water Temperature, Unknown Toxicity	Under Development
	Cosumnes River, Lower (below Michigan Bar; partly in Delta Waterways, eastern portion)	Invasive Species, *Escherichia coli*, Sediment Toxicity	Under Development
	Mokelumne River, Lower (in Delta Waterways, eastern portion)	Copper, Zinc, Chlorpyrifos, Mercury, Dissolved Oxygen, Unknown Toxicity	Under Development
	Calaveras River, Lower (from Stockton Diverting Canal to the San Joaquin River; partly in Delta waterways, eastern portion)	Chlorpyrifos, Diazinon	Approved: 2007
		Pathogens	Approved: 2008
		Organic Enrichment/Low Dissolved Oxygen, Mercury	Under Development
	Kings River, Lower (Island Weir to Stinson and Empire Weirs); Kings River, Lower (Pine Flat Reservoir to Island Weir); Kaweah River (below Terminus Dam, Tulare County); Kaweah River, Lower (includes St Johns River)[28]	Electrical Conductivity, Molybdenum, Toxaphene, Chlorpyrifos[29], pH[30], Unknown Toxicity	Under Development
Sacramento and San Joaquin River Delta	Sacramento San Joaquin Delta	Mercury	Approved: 2011
		Dioxin compounds, Furan Compounds, Invasive Species, PCBs, Selenium, Chlordane, DDT, Dieldrin	Under Development

Region	Waterbody	Constituent of Concern	TMDL Status[1]
Sacramento and San Joaquin River Delta (cont'd)	Delta waterways (central, eastern, northern, northwestern, western portion, southern portions, export area, and Stockton Ship Channel)	Organic Enrichment/Low Dissolved Oxygen[32]	Approved: 2006
		Chlorpyrifos[31], Diazinon	Approved: 2007
		Pathogens,[32] Mercury, Chlordane[33], DDT, Dieldrin[33], Group A Pesticides, Dioxin[32], Electrical Conductivity[34], Furan Compounds[32], Invasive Species, PCBs[35], Unknown Toxicity	Under Development
	San Joaquin River at Vernalis	Salinity and Boron	Under Development
Suisun Bay and Suisun Marsh	Suisun Bay	Mercury	Approved: 2008
		PCBs, Selenium, Chlordane, DDT, Dieldrin, Dioxin compounds, Furan Compounds, Invasive Species	Under Development
	Suisun Marsh Wetlands	Mercury, Nutrients, Organic Enrichment/Low Dissolved Oxygen, Salinity/TDS/Chlorides	Under Development
San Francisco Bay Region	Carquinez Strait and San Pablo Bay	Mercury	Approved: 2008
		PCBs, Chlordane, DDT, Dieldrin, Dioxin compounds, Furan Compounds, Invasive Species, Selenium	Under Development
	San Francisco Bay	Selenium	Approved: 2010
		PCBs, Chlordane, DDT, Dieldrin, Dioxin compounds, Furan Compounds, Invasive Species, Trash	Under Development
Santa Clara River Basin	Castaic Lake	Mercury	Under Development

Source: SWRCB, 2012

Notes:

[1] TMDL status is either completed and approved by USEPA in the year specified or under development.

[2] Water temperature is only a constituent of concern for the South Fork Trinity River and a TMDL is under development.

[3] Mercury is only a constituent of concern for the East Fork Trinity River in the upper hydrologic area and a TMDL is under development.

[4] Acid Mine Drainage is a constituent of concern at Spring Creek only.

[5] Chlordane, DDT, PCBs, Dieldrin not constituents of concern for Sacramento River (Keswick Dam to Red Bluff).

[6] Chlordane not a constituent of concern for Sacramento River (Red Bluff to Knights Landing).

[7] Mercury not a constituent of concern for Sacramento River (Keswick Dam to Cottonwood Creek). Mercury TMDL is under development for Sacramento River (Knights Landing to the Delta).

[8] Dieldrin TMDL for Sacramento from Knights Landing to the Delta is under development.

[9] Mercury is the only constituent of concern for Yuba River and a TMDL is expected to be complete in 2021. Mercury TMDL expected to be complete in 2021 for Feather River, Lower (Lake Oroville Dam to Confluence with Sacramento River). Mercury and PCBs are the only constituents of concern for Lake Oroville and TMDLs are under development for both constituents.

[10] Mercury is the only constituent of concern for Folsom Lake and Lake Natoma. Mercury TMDL is under development for American River, Lower (Nimbus Dam to confluence with Sacramento River).

[11] Mercury TMDL for Panoche Creek (Silver Creek to Belmont Avenue) is under development.

[12] Not a constituent of concern for Mendota Pool.

[13] pH and selenium are the only constituents of concern for Agatha Canal (Merced County). Electrical conductivity and Selenium are the only constituents of concern for Grasslands Marshes. Boron, Electrical Conductivity, Pesticides, Selenium, and Unknown Toxicity are the only constituents of concern for Mud Slough, North (downstream of San Luis Drain). pH, selenium, and pesticides are not constituents of concern for Salt Slough (upstream from confluence with San Joaquin River).

[14] The CVRWQCB completed a TMDL for selenium in the lower San Joaquin River (downstream of the Merced River) in 2001 and Salt Slough in 1997/1999, and USEPA approved this in 2002.

[15] The unknown toxicity TMDL for Mud Slough (downstream of San Luis Drain) is under development.

[16] Mercury is the only constituent of concern for Millerton Lake and a TMDL is under development.

[17] Selenium is only a constituent of concern in San Joaquin River (Mud Slough to Merced River).

[18] Electrical conductivity, Escherichia coli, mercury and selenium are not constituents of concern for San Joaquin River (Mendota Pool to Bear Creek). The Electrical Conductivity TMDL for San Joaquin River (Bear Creek to Merced River) is expected to be written and complete in 2019. The Mercury TMDL for San Joaquin River (Bear Creek to Stanislaus River) is under development.

[19] Diazinon not a constituent of concern for San Joaquin River (Bear Creek to Mud Slough and Merced River to Tuolumne River).

[20] DDE and alpha-BHC is only a constituent of concern in San Joaquin River (Merced River to Tuolumne River).

[21] The Boron TMDL for San Joaquin River (Merced to Tuolumne River) was approved by the USEPA in 2007. Boron is not a constituent of concern for the San Joaquin River (Tuolumne River to Stanislaus River).

[22] The Electrical Conductivity TMDL for San Joaquin River (Tuolumne River to Stanislaus River) is under development.

[23] Invasive species only a constituent of concern for the San Joaquin River (Friant Dam to Mendota Pool).

[24] Arsenic not a constituent of concern in San Joaquin River except Bear Creek to Mud Slough.

[25] Escherichia coli is not a constituent of concern for San Joaquin River (Mendota Pool to Bear Creek and Merced River to Stanislaus River). The Escherichia coli TMDL for San Joaquin River (Bear Creek to Mud Slough) is under development.

[26] Water temperature is only a constituent of concern for San Joaquin River (Merced River to Stanislaus River).

[27] Mercury is the only constituent of concern for New Melones Reservoir and Tulloch Reservoir. The diazinon TMDL for lower Merced River and lower Stanislaus River is under development. The Chlorpyrifos TMDL for the lower Merced River is under development. The Mercury TMDL for lower Merced River and lower Stanislaus River TMDL is under development. The Unknown Toxicity TMDL for lower Stanislaus River and lower Merced River is under development.

[28] The only constituents of concern for Kings River, Lower (Island Weir to Stinson and Empire Weirs) are electrical conductivity, toxaphene, molybdenum.

[29] Chlorpyrifos is only a constituent of concern for Kings River, Lower (Pine Flat Reservoir to Island Weir).

[30] pH is only a constituent of concern for Kaweah River (below Terminus Dam, Tulare County).

[31] Chlorpyrifos TMDL for Delta waterways (central and western portions) are under development.

[32] Not a constituent of concern for Delta waterways except for Stockton Ship Channel.

[33] Not a constituent of concern for Delta waterways except for northern portion.

[34] Not a constituent of concern for Delta waterways (central, northern, eastern portions, and Stockton Ship Channel).

[35] Not a constituent of concern for Delta waterways except for the northern portion and the Stockton Ship Channel.