Table 1: TMDLs in the San Francisco Bay Delta Estuary Addressing Aquatic Resource Impairments Identified in the ANPR

TMDL Pollutant/Stressor and water body (EPA Approval Date)	Primary Pollutant Sources & Allocations	Target Compliance Date	Load Limits/TMDL Targets Achieved Load Reduction/TMDL Progress
Selenium **Salt Slough** (1999)	• Major: Shallow ground water drainage (agricultural tile drainage) from the 97,000-acre Drainage Project Area of the Grassland Watershed (88% of total load) • Minor: Distributed inputs throughout the San Joaquin River Basin • 100% load allocation for non point source	October 2010[1]	• Selenium loads reduced by two-thirds (1996-2007) through water & crop management. • Selenium contaminated shallow ground water drainage is routed away from Salt Slough to achieve load limits (balance) • Selenium removed as impairment from Salt Slough on 303(d) List
Selenium **Grasslands Marshes** (2000)	• Major: Shallow ground water drainage (agricultural tile drainage) from the 97,000-acre Drainage Project Area of the Grassland Watershed (88% of total load) • Minor: Distributed inputs throughout the San Joaquin River Basin • 100% load allocation for non point source	October 2010[1]	• Selenium loads reduced by two-thirds (1996-2007) through water & crop management. • Selenium contaminated shallow ground water drainage is rerouted away from Grasslands Marsh to achieve load limits • Selenium removed as impairment from Grasslands Marshes on 303(d) List
Selenium **Lower San Joaquin River**[2] (2003)	• Major: Subsurface agricultural return flows (tile drainage) from the 97,000-acre Drainage Project Area of the Grassland Watershed (88% of total load) • Minor: Distributed inputs throughout the San Joaquin River Basin • 100% load allocation for non point source	December 2019	• Selenium removed as impairment downstream of the confluence with the Merced River on 303(d) list • Selenium loads reduced by two-thirds (1996-2007) through water & crop management. • Standards not yet achieved for Mud Slough North, from the end of the San Luis Drain to the San Joaquin River and in the San Joaquin River from Mud Slough, North, to the Merced River.

Table 1: TMDLs in the San Francisco Bay Delta Estuary Addressing Aquatic Resource Impairments Identified in the ANPR

TMDL Pollutant/Stressor and water body (EPA Approval Date)	Primary Pollutant Sources & Allocations	Target Compliance Date	Load Limits/TMDL Targets Achieved Load Reduction/TMDL Progress
Diazinon & Chlorpyrifos Sacramento County Urban Streams[3] (2004)	• Urban runoff from applications of pesticide in non-agricultural areas	September 2013	• Elk Grove Creek impairment removed from 303(d) List • Central Valley RWQCB anticipates delisting most of these streams in the next 303(d)/305(b) Report. • FIFRA registrations cancelled for most non-agricultural uses. • Water quality improving.
Low Dissolved Oxygen (DO) Stockton Deep Water Ship Channel (2007)	• WWTP, urban and rural runoff sources of oxygen demanding substances[5] (e.g., organic nutrients). • Ship channel geometry.[6] • Reduced flow.[7] • TMDL assigns equal responsibility of impairment to all three factors.	December 31, 2011	• Substantial reduction in organic nutrient discharges from Stockton WWTP. • Installation of aerator. • DO levels improving, but are still too often below the objective.
Diazinon & Chlorpyrifos Lower San Joaquin River[4] (2006)	• Primarily agricultural applications. • Load and wasteload allocations are equal to the Delta Loading Capacity.	2011	• Approximately 46 miles of San Joaquin River de-listed for diazinon • 85 miles remain on the 303(d) list for diazinon.. • 130 miles remain on 303(d) list for chlorpyrifos.

Table 1: TMDLs in the San Francisco Bay Delta Estuary Addressing Aquatic Resource Impairments Identified in the ANPR

TMDL Pollutant/Stressor and water body (EPA Approval Date)	Primary Pollutant Sources & Allocations	Target Compliance Date	Load Limits/TMDL Targets Achieved Load Reduction/TMDL Progress
Diazinon & Pesticide-Related Toxicity **Bay Area Urban Creeks** (2007)	• Urban runoff that contains pesticides as a result of pesticide application for structural pest control, landscape maintenance, agricultural, and other pest management purposes. • 100% of the TMDL is allocated to urban runoff as a "wasteload allocation" to stormwater point sources	Adjusts to changes in pesticides causing toxicity	• Diazinon and chlorpyrifos registrations cancelled for most non-agricultural uses are is no longer the source of aquatic toxicity. • Aquatic toxicity in urban streams is caused by pyrethroid pesticides • Pesticide-related toxicity load limits are not met. Load limits are met for diazinon.
Diazinon & Chlopryifos **Sacramento-San Joaquin River Delta** (2007)	• Primarily agricultural applications. • Load and wasteload allocations are equal to the Delta Loading Capacity.	December 1, 2011	• 2011 monitoring shows diazinon concentrations below objective in some Delta waterways. • 2011 monitoring shows chlorpyrifos concentrations exceeding objectives in some Delta waterways. • All waters in Delta remain on 303(d) List in for diazinon & chlorpyrifos.
Diazinon & Chlorpyrifos **Lower Feather River and Lower Sacramento River[8]** **(2008)**	• Primarily agricultural applications. • Load and wasteload allocations are equal to the Delta Loading Capacity objectives.	2010	• Diazinon impairment removed from 79-river miles of Lower Sacramento and Feather Rivers. • Load limits & objectives met for chlorpyrifos on Lower Sacramento. • Chlorpyrifos impairment remains on Lower Feather River.

1. The 5 µg/L four-day average water quality objective for the SJR below the Merced River must be met in above normal and wet years starting in water year 2006. The 5 µg/L four-day average objective must be met for critically dry, dry and below normal years starting in water year 2011. The 5 µg/L four-day average water quality objective must also be met for all year types in Mud Slough and the SJR from Sack Dam to the Merced River starting in water year 2011.
2. 50 miles of Lower San Joaquin River between Salt Slough (upstream border) and Vernalis at Airport Way Bridge (downstream border).
3. Arcade Creek, Elder Creek, Elk Grove Creek, Morrison Creek, Chicken Ranch Slough, and Strong Ranch Slough.
4. 130 miles of Lower San Joaquin River from Mendota Dam to Vernalis at Airport Way bridge.
5. Stockton WWTP, algae loads from the watershed, and urban and agricultural runoff.

Table 1: TMDLs in the San Francisco Bay Delta Estuary Addressing Aquatic Resource Impairments Identified in the ANPR

6. Channel geometry reduces the assimilation capacity of oxygen demanding substances in three ways: 1) the deep wide channel reduces water velocity, increasing water residence time, concentration of organic material, and consumption of available oxygen; 2) the small water surface area to depth ratio reduces the proportion of water that is naturally aerated at the water air surface; and 3) poor light penetration, the result of increasing the concentration of organic material, encourages algal death and consumption of oxygen through decay process.
7. Reduced flows from San Joaquin River water diversions to the State and Federal water projects, water transfers, and in basin diversions reduce reduces the assimilation capacity of oxygen demanding substances by reduces water velocity, increasing water residence time, and concentration of organic material which consumes available oxygen.
8. Sacramento River below Shasta Dam, Feather River below Oroville Dam.

Table 2: Mercury and Methylmercury TMDLs in San Francisco Bay Delta Estuary Watershed

TMDL Pollutant/Stressor and water body (EPA Approval Date)	Primary Pollutant Sources & Allocations	Target Compliance Date	Implementation Progress
Mercury **Clear Lake** **(2003)**	• 100% Load Allocation = nonpoint sources, Sulphur Bank mercury mine, atmospheric deposition, tributaries,	2023	• Implementation activities at Sulphur Bank mine are occurring.[1] • Water quality monitoring is done for special studies and associated with individual actions. • Monitoring data is not easily available and a periodic monitoring program has not been established.
Mercury Cache, Bear, & Sulphur Creeks & Harley Gulch **(2007)**	• 100% Load Allocation = nonpoint sources, mercury mines	2027[2]	• Water quality monitoring is done for special studies and associated with individual actions. • Monitoring data is not easily available and a periodic monitoring program has not been established.
Mercury **San Francisco Bay** **(2008)**	• Load Allocation = 85% to bed erosion, upstream watersheds, atmospheric deposition, non-urban and stormwater runoff. • Waste Load Allocation is ~ 15% of sources including NPDES facilities and MS4 outfalls.	2030	
Mercury & Methylmercury Guadalupe River Watershed **(2010)**	• ~85% Load Allocation. Nonpoint sources = mining waste, impoundments (tributary lakes and reservoirs), and atmospheric deposition. • ~ 15% Waste Load Allocation to urban storm water point sources (MS4s).	2030	
Mercury & Methylmercury Sacramento-San Joaquin Delta **(2011)**	• Load Allocation = 96% to Nonpoint sources including: Agricultural drainage, Atmospheric wet deposition, Open water, Tributary Inputs, Inputs from Upstream Subareas, Urban (nonpoint source), Wetlands. • Waste Load Allocation is ~ 4% of sources including NPDES facilities and MS4 outfalls.	2030	• Workplans for phase I control studies are being created. • Water quality monitoring will be part of control studies and other implementation actions. • Developing exposure reduction strategy • Monitoring data will be made available after it is generated.

1. Clear Lake Mercury TMDL 2010 Update http://www.swrcb.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/clear_lake_hg/cl_final_tmdl_5yr_update.pdf
2. Target date for load reduction achievement – 15 – 20 years after implementation of mercury control program; 5 – 10 additional years after water column objectives are met to reduce fish tissue concentrations to objective concentrations.