Attachment A to Resolution No. ~~R11-008~~R22-XXX

Amendment to the Water Quality Control Plan – Los Angeles Region to ~~Incorporate~~ Revise the Total Maximum Daily Load for Toxic Pollutants in Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters

Adopted by the California Regional Water Quality Control Board, Los Angeles Region on ~~May 5, 2011~~ [Insert Date]

Amendments

~~**Table of Contents**~~

~~Add:~~

~~Chapter 7. Total Maximum Daily Loads (TMDLs)~~

~~7-40 Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters Toxic Pollutants TMDL~~

~~**List of Figures, Tables, and Inserts**~~

~~Add:~~

~~Chapter 7. Total Maximum Daily Loads (TMDLs) Tables~~

~~7-40 Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters Toxic Pollutants TMDL~~

~~7-40.1 Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters Toxic Pollutants TMDL – Elements~~

~~7-40.2 Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters Toxic Pollutants TMDL – Implementation Schedule~~

Chapter 7. Total Maximum Daily Loads (TMDLs)

Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters Toxic Pollutants TMDL

This TMDL was adopted by:

The Regional Water Quality Control Board on **May 5, 2011.**

This TMDL was approved by:

The State Water Resources Control Board on **February 7, 2012.**

The Office of Administrative Law on **March 21, 2012.**

The U.S. Environmental Protection Agency on **March 23, 2012.**

This TMDL is effective on **March 23, 2012.**

This TMDL was revised by:

The Regional Water Quality Control Board on [Insert Date]

This revised TMDL was approved by:

The State Water Resources Control Board on [Insert Date]

The Office of Administrative Law on [Insert Date]

The U.S. Environmental Protection Agency on [Insert Date]

The elements of the TMDL are presented in Section 7-40.1 and the Implementation Plan in Table 7-40.2.

7-40.1 Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters Toxic Pollutants TMDL – Elements

1. Problem Statement

The waters of Dominguez Channel and the Greater Los Angeles and Long Beach Harbor area[1] are impaired by heavy metals and organic pollutants. These water bodies are included on the State's Clean Water Act 303(d) impaired waters list for one or more of the following pollutants: cadmium, chromium, copper, mercury, lead, zinc, chlordane, dieldrin, toxaphene, DDT, PCBs, certain PAH compounds, benthic community effects and toxicity. These impairments exist in one or more environmental media—water, sediment, or tissue. Impairments in fish tissue are for DDT, PCBs, toxaphene, chlordane and dieldrin.

Beneficial uses designated in these waters to protect aquatic life include the marine habitat use (MAR) and rare, threatened or endangered species habitat use (RARE). In addition, the estuaries (EST) are recognized as areas for spawning, reproduction and/or early development (SPWN), migration of aquatic organisms (MIGR), and wildlife habitat (WILD). Dominguez Channel also has an existing designated use of warm freshwater habitat (WARM) and the Los Angeles River Estuary has the designated use of wetland habitat (WET). Beneficial uses associated with human use of these waters include recreational use for water contact (REC1), non-contact water recreation (REC2), industrial service supply (IND), navigation (NAV), commercial and sport fishing (COMM), and shellfish harvesting (SHELL).

[1] Dominguez Channel includes the Dominguez Channel Estuary and Torrance Lateral Channel and Greater Los Angeles/Long Beach Harbor waters include Inner and Outer Harbor, Main Channel, Consolidated Slip, Southwest Slip, Fish Harbor, Cabrillo Marina, Inner Cabrillo Beach, Los Angeles River Estuary, and San Pedro Bay.

Because of the impairments, these waterbodies fail to fully support the designated beneficial uses. The goal of this TMDL is to protect and restore fish tissue, water and sediment quality in the Dominguez Channel and Greater Los Angeles and Long Beach Harbor waters by remediating contaminated sediment and controlling the sediment loading and accumulation of contaminated sediment in the Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters.

2. Numeric Target

Applicable water quality objectives for this TMDL are narrative objectives for Chemical Constituents, Bioaccumulation, Pesticides, and Toxicity in the Basin Plan and the numeric water quality criteria promulgated in 40 CFR section 131.38 (the California Toxics Rule (CTR)). In addition, sediment condition ~~objectives~~ numeric targets were determined using the sediment quality objectives (SQOs) contained in the State Water Quality Control Plan for Enclosed Bays and Estuaries ~~– Part 1~~ Sediment Quality Provisions (SQPs~~O Part 1~~) and ~~the~~ sediment quality guidelines.[2]

The following tables provide the water, sediment and fish tissue numeric targets for the Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters Toxic Pollutants TMDLs.

Water Column Targets

Water targets were ~~determined~~ derived from~~by~~ this Basin Plan and the ~~California Toxics Rule (~~CTR~~)~~. Site-specific conversion factors were developed to convert CTR acute dissolved metal criteria to total recoverable metals using *The Metals Translator Guidance for Calculating a Total Recoverable Permit Limit ~~From~~from a Dissolved Criterion* EPA 823-B-96-007.

Because exceedances of CTR criteria were only observed in freshwaters of the Dominguez Channel during wet weather, targets are set for wet weather only. Site-specific wet-weather conversion factors were calculated using paired dissolved and total metals data and the statistical method outlined in the Guidance.

[2] The sediment quality guidelines are those in Long, ER, LJ Field and DD MacDonald. 1998. *Predicting Toxicity in Marine Sediments with Numerical Sediment Quality Guidelines*, *Environ. Toxicol. Chem*. **17**:4, 714-727. MacDonald, DD, CG Ingersoll and TA Berger. 2000. *Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems*. Arch. Environ. Contam. Toxicol. **39**:20-31.

Table 1 Dissolved Metals and Organic Compounds Numeric Targets (ug/L)

Pollutant	Freshwater Acute Criteria for Aquatic Life	Freshwater Chronic Criteria for Aquatic Life	Saltwater Acute Criteria for Aquatic Life	Saltwater Chronic Criteria for Aquatic Life	Human Health Criteria for Consumption of Organisms only
Copper	6.99*	4.95*	4.8	3.1	-
Lead	30.14*	1.17*	210	8.1	-
Zinc	65.13*	65.66*	90	81	-
Mercury	-	-	-	-	0.051
Chlordane	n/a	n/a	0.09	0.004	0.00059
4,4'-DDT	1.1	0.001	0.13	0.001	0.00059
Total PCBs	-	0.014	-	0.03	0.00017
Benzo[a]pyrene**	-	-	-	-	0.049
Dieldrin	0.24	0.056	0.71	0.0019	0.00014

*Freshwater aquatic life criteria for Cu, Pb and Zn are expressed as a function of total hardness (mg/L) in the water body. Values presented correspond to median hardness from 2002 to 2010 of 50 mg/L based upon Los Angeles County Department of Public Works data from Station ID S28 (n = 35).

**CTR human health criteria were not established for total PAHs. Therefore, the CTR criteria for individual PAHs of 0.049 µg/L are applied individually to benzo(a)pyrene, benzo(a)anthracene, and chrysene. The CTR human health criterion for Pyrene is 11,000 µg/L. Other PAH compounds in the CTR shall be screened as part of the TMDL monitoring.

- means that no criteria were established for California.

Table 2 Total Recoverable Metals~~,~~ Freshwater Numeric Targets (ug/L)

Metal	Acute Dissolved CTR Criteria	Conversion Factor*	Acute Total Recoverable Metals
Copper	6.99	0.722	9.7
Lead	30.14	0.706	42.7
Zinc	65.13	0.935	69.6

* Site-specific conversion factors were calculated using Los Angeles County Department of Public Works data from Station ID S28 using the data record 2002-2010 (n = 35), which had a median hardness of 50 mg/L. Site-specific conversion factors maybe recalculated based on updated data at the time of permit issuance, modification, or renewal.

Freshwater toxicity target: This TMDL also establishes a numeric toxicity target of 1.0 toxicity unit, chronic (1.0 TUc) to address toxicity.

TU_c = Toxicity Unit, chronic = 100/NOEC (no observable effects concentration)

Targets based on new toxicity criteria that achieve the narrative Toxicity objective of Chapter 3 of this Basin Plan may substitute for the TU_c of 1.0, when those new criteria are adopted and in effect.

Fish Tissue and Associated Sediment Targets

Fish tissue targets were determined from *Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene*, developed by the Office of Environmental Health Hazard Assessment (OEHHA, 2008) to assist agencies in

developing fish tissue-based criteria for pollution mitigation or elimination and to protect humans from consumption of contaminated fish. Associated sediment targets required to achieve the fish tissue targets were determined from several sources depending on the contaminant.

Table 3 Fish Tissue and Associated Sediment Targets

Pollutant	Fish Tissue Target (µg/kg wet)	Associated Sediment Target (µg/kg dry)
Chlordane	5.6	1.3 [b]
Dieldrin	0.46	n/a
Total DDT	21	1.9 [b]
Total PCBs	3.6	3.2 [c]
Total PAHs	5.47[a]	n/a
Toxaphene	6.1	0.1 [d]

[a] Total PAHs in fish from US EPA screening value.
[b] Chlordane and total DDT associated sediment values from SFEI (2007) "Indicator development and framework for assessing indirect effects of sediment contaminants", SFEI Contribution #524.
[c] Total PCBs - associated sediment target from Gobas, F. and J. Arnot (2010) "Food Web Bioaccumulation Model for Polychlorinated Biphenyls in San Francisco Bay, California, USA", ET&C **29**:6, 1385-95.
[d] Toxaphene value from New York State (1999), assumes 1% TOC.
n/a indicates that an associated sediment target is not established in this TMDL at this time because there is no Biota Sediment Accumulation Factor (BSAF) in literature to use in the calculation. If BSAFs are developed in the future, associated sediment targets for dieldrin and/or PAHs may be added during reconsideration of the TMDL.

Sediment Targets

Sediment targets were determined usingby the narrative water quality objectives instandards of this Basin Plan and, the SQO Part 1 and the sediment quality guidelines of Long et al. (1998) and MacDonald et al. (2000), which are recommended by the State Listing Policy. The fresh-water sediment numeric targets for Dominguez Channel are based on the freshwater Threshold Effect Concentration (TEC) sediment guidelines compiled by the National Oceanic and Atmospheric Administration (NOAA) in the Screening Quick Reference Tables (SQuiRTs). The marine sediment quality guidelines of Effect Range Low (ERL), also from NOAA SQuiRTs, were used to establish the numeric targets for marine sediment for the greater Los Angeles and Long Beach Harbor waters.

Thesce sediment numeric targets based on the TECs and ERLs, or those derived from the Fish Contaminant Goals (FCGs), which ever are lower are set as the sediment quality thresholdsused for the calculation of loading capacity and allocations. This TMDL anticipates that rRevisions to specific sediment quality targets may be determined by development of site-specific sediment quality values (SQV).

Table 4 Sediment Numeric Targets for Metals

Metals	Freshwater Sediment (mg/kg)	Marine Sediment (mg/kg)
Cadmium	n/a	1.2
Copper	31.6	34
Lead	35.8	46.7
Mercury	n/a	0.15
Zinc	121	150
Chromium	n/a	81

Table 5 Sediment Numeric Targets for Organic Compounds

Organics	Marine Sediment (µg/kg)
Chlordane, total	0.5
Dieldrin	0.02
Toxaphene	0.10*
Total PCBs	22.7
Benzo[a]anthracene	261
Benzo[a]pyrene	430
Chrysene	384
Pyrene	665
2-methylnaphthalene	~~2017~~0
Dibenz[a,h]anthracene	~~260~~63.4
Phenanthrene	240
Hi MW PAHs	1700
Lo MW PAHs	552
Total PAHs	4,022
Total DDT	1.58

*Toxaphene value from *Technical Guidance for Screening Contaminated Sediments*, New York State, Department of Environmental Conservation, Division of Fish, Wildlife and Marine Resources (1999), assumes 1% TOC.

n/a indicates that a freshwater sediment target is not established in this TMDL for this constituent, since impairments for the constituent is in saltwater only.

These sediment targets are not intended to be used as 'clean-up standards' for navigational, capital or maintenance dredging or capping activities; rather they are long-term sediment concentrations that should be attained after TMDL implementation. In addition, the categories designated in the SQPs as Unimpacted and Likely Unimpacted by the interpretation and integration of multiple lines of evidence shall be considered as the protective narrative objective for sediment toxicity and benthic community effects. The SQOs established in the SQPs are based on statistical significance and magnitude of the effect. Therefore, this TMDL implicitly includes sediment toxicity and benthic community targets by its use of the SQPs ~~SQO Part 1~~. The SQPs are used to assess the ongoing condition of sediment quality, and as an alternative demonstration of compliance for the sediment-based allocations.~~These sediment targets are not intended to be used as 'clean-up standards' for navigational, capital or maintenance dredging or~~

capping activities; rather they are long-term sediment concentrations that should be attained after reduction of external loads, targeted actions addressing internal reservoirs of contaminants, and environmental decay of contaminants in sediment. In addition, the categories designated in the SQO Part 1 as **Unimpacted** and **Likely Unimpacted** by the interpretation and integration of multiple lines of evidence shall be considered as the protective narrative objective for sediment toxicity and benthic community effects. The thresholds established in the SQO Part 1 are based on statistical significance and magnitude of the effect. Therefore, this TMDL implicitly includes sediment toxicity and benthic community targets by its use of the SQO Part 1.

Fish Tissue and Associated Sediment Targets

Fish tissue targets were determined from *Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene*, developed by OEHHA (2008) to assist agencies in developing fish tissue-based criteria for pollution mitigation or elimination and to protect humans from consumption of contaminated fish. Associated sediment targets required to achieve the fish tissue targets were determined from several sources depending on the contaminant.

Table 5 Fish Tissue and Associated Sediment Targets

[a] Total PAHs in fish from EPA screening value.

[b] Chlordane and total DDT associated sediment values from SFEI (2007) "Indicator development and framework for assessing indirect effects of sediment contaminants", SFEI Contribution #524.

[c] Total PCBs – associated sediment target from Gobas, F. and J. Arnot (2010) "Food Web Bioaccumulation Model for Polychlorinated Biphenyls in San Francisco Bay, California, USA", ET&C **29**:6, 1385-95.

[d] Toxaphene value from New York State (1999), assumes 1% TOC.

3. Sources Analysis

Monitoring data from NPDES discharges and land use runoff coefficients were used to estimate the magnitude of metals, organo-chlorine pesticides, PCBs, and PAHs loads to Dominguez Channel and Greater Los Angeles and Long Beach Harbor waters.

PCBs, DDT, dieldrin, and chlordane are legacy pollutants for the most part, yet, they remain present in the environment, bound to fine-grained particles. Because they are legacy pollutants and are subject to environmental decay, their concentrations are gradually decreasing over time. When these particles become waterborne, the chemicals are ferried to new locations. Urban runoff and rainfall higher in the watersheds mobilize the particles, which are then washed into storm drains and channels that discharge to the Dominguez Channel and greater Harbor waters. Metals and PAHs are currently generated or deposited in the watersheds and are then washed into storm drains and channels that discharge to the Dominguez Channel and greater Harbor waters.

Unlike DDT, dieldrin, and chlordane, PCBs remain in use today, albeit in much smaller amounts than in the past. While much of the PCB pollution in the Greater Harbor waters happened decades ago, when PCBs were still in wide use, a smaller amount of PCBs

still enters the Greater Harbor waters from land-based sources. In Los Angeles County, for example, there are transformers with over 17,000 kg of PCBs in use. In addition, PCBs are present in many buildings which were built or renovated from 1950 to 1979.

Statewide, mussel watch data suggest large declines in PCBs during the past 20 years. Long-term State Mussel Watch monitoring sites in Southern California that exhibited very high initial PCB concentrations (> 5000 ppb lipid weight) have significantly declined. Two stations in the Port of Long Beach declined about 4% in total PCB Aroclors between 1982 and 2010. However, declines in PCBs are much less than declines in DDT. The Watershed Loading Estimation special study conducted by the Port of Los Angeles and Port of Long Beach in 2013 was designed to provide high-resolution data of PCB and DDT concentrations in stormwater and dry weather flows into the Ports' jurisdictions from the watersheds of the Los Angeles River and the Dominguez Channel. This study confirmed that PCBs and DDTs are still entering San Pedro Bay from watershed sources.

Briefly, there are several categories of pollutant sources to the waters of concern in these TMDLs. Point sources include stormwater and urban runoff (MS4) and other NPDES discharges, including but not limited to Port operations, Terminal Island Water Reclamation Plant (TIWRP), refineries, and generating plants. Nonpoint sources include existing contaminated sediments and direct (air) deposition.

Dominguez Channel waters: The major point sources of organo-chlorine pesticides, PCBs, and metals into Dominguez Channel are stormwater and urban runoff discharges. Nonpoint sources include atmospheric deposition and fluxes from contaminated sediments into the overlying water.

Current loads of metals into Dominguez Channel were estimated using Loading Simulation Program in C++ (LSPC) model output from simulated flows for 1995-2005. Monitoring data from NPDES discharges and land use runoff coefficients were analyzed along with Channel stream flow rates to estimate the magnitude of metal loadings. In recognition of the wide variety of stream flow rates generated by various rainfall conditions, flow duration curves were utilized to analyze the metals loading during wet weather.

Greater Los Angeles and Long Beach Harbor waters: A variety of activities over the past decades in the four contributing watersheds (Dominguez Channel, Los Angeles River, San Gabriel River and the nearshore watershed) and in the Harbors themselves have contributed to the sediment contamination. The contaminated sediments are a reservoir of historically deposited pollutants. Stormwater runoff from manufacturing, military facilities, fish processing plants, wastewater treatment plants, oil production facilities, and shipbuilding or repair yards in both Ports discharged untreated or partially treated wastes into Harbor waters. Current activities also contribute pollutants to Harbor sediments. In particular, stormwater runoff from port facilities, commercial vessels (ocean going vessels and harbor craft), recreational vessels, and the re-

suspension of contaminated sediments via natural processes and/or anthropogenic activities including (ship) propeller wash within the Ports also contributes to transport of pollutants within the Harbors. Loadings from the four contributing watersheds are also potential sources of metals, pesticides, PCBs, and PAHs to the Harbors.

The major nonpoint source of pesticides and PCBs to the greater Harbor waters is the current sediments. The re-suspension of these sediments contributes to the fish tissue impairments. In addition, atmospheric deposition may be a potential nonpoint source of metals to the watershed, through either direct deposition or indirect deposition.

Current loading of metals, PAHs, DDT and PCBs to contaminated sediments within the Dominguez Channel Estuary and Greater Harbor waters was estimated using monitoring data from special studies and water body surface area for air deposition; discharge results for refineries and TIWRP; and Environmental Fluid Dynamics Code (EFDC) model output for 2002-2005. Model inputs included the existing average sediment concentration in the top 5 cm of bed sediments and the total sediment deposition rate per waterbody.

4. Linkage Analysis

The linkage analysis connects pollutant loads to the numeric targets and protection of beneficial uses of Dominguez Channel and Greater Los Angeles and Long Beach Harbor waters. To represent the linkage between source contributions and ambient water and sediment response, two dynamic water quality models were developed to simulate source loadings and transport of the listed pollutants in Dominguez Channel and Greater Los Angeles and Long Beach Harbor waters. The Environmental Fluid Dynamics Code (EFDC) and Loading Simulation Program in C++ (LSPC) models were selected to simulate the pollutants in this TMDL.

LSPC for freshwater loadings of metals and total PAHs, DDT, and PCBs. LSPC was developed for Dominguez Channel based on information initially provided by the Southern California Coastal Water Research Project (SCCWRP) for this watershed. In addition, Los Angeles River and San Gabriel River LSPC models were updated from earlier TMDL models. Model development throughout the Los Angeles Region relies on Event Mean Concentrations (EMC) as well as simulated flows to estimate pollutant loadings. Flow data records for 1995-2005 were used to calibrate LSPC models for each watershed; similar simulation time frames were used to generate simulated flows for each watershed. Dominguez Channel freshwater metals TMDLs examined only wet weather flows; however, LSPC output for dry and wet weather conditions was applied to all estuarine and marine receiving waters.

The nearshore watershed was analyzed and modeled using LSPC by breaking it into 67 subwatersheds that discharge directly to the Greater Los Angeles and Long Beach Harbor waters. These sub-watersheds were then aggregated by receiving waterbody;

e.g. nearshore contributions to Inner Harbor consisted of stormdrains and surface (sheet) flows that discharge directly into the Inner Harbor.

The tables below show total loads from the four contributing watersheds to the Greater Harbor waters. Overall, the Los Angeles River is the largest freshwater contributor of pollutants to the greater Harbor waters; flows from the Los Angeles River primarily impact water quality in eastern San Pedro Bay. The Inner Harbor receives the bulk of the loading from the nearshore watershed.

Table 6 Comparative Watershed Loading to Greater Harbor Waters for Wet Condition Using LSPC Modeled Existing Loading by Watershed (1995-2005)

Watershed	Loading	Sediment	Total Copper	Total Lead	Total Zinc	Total DDT	Total PAH	Total PCB
Dominguez Channel	% of Total Loading	5.60%	4.30%	3.00%	5.00%	9.20%	8.00%	2.30%
Dominguez Channel	Average Daily Load (kg/day)	1.88E+05	3.58E+01	2.08E+01	3.56E+02	2.20E-02	2.04E+00	1.38E-02
Los Angeles River	% of Total Loading	72.00%	81.10%	71.50%	72.20%	89.50%	70.20%	97.50%
Los Angeles River	Average Daily Load (kg/day)	2.79E+06	7.85E+02	5.67E+02	5.89E+03	2.46E-01	2.07E+01	6.86E-01
San Gabriel River	% of Total Loading	20.40%	12.50%	23.30%	20.20%	0.70%	16.10%	0.10%
San Gabriel River	Average Daily Load (kg/day)	4.90E+05	7.51E+01	1.15E+02	1.02E+03	1.15E-03	2.95E+00	3.11E-04
Nearshore Watershed	% of Total Loading	1.90%	2.10%	2.20%	2.60%	0.70%	5.80%	0.20%
Nearshore Watershed	Average Daily Load (kg/day)	6.54E+04	1.78E+01	1.53E+01	1.84E+02	1.59E-03	1.50E+00	9.92E-04

Table 7 Comparative Watershed Loading to Greater Harbor Waters for Dry Condition Using LSPC Modeled Existing Loading by Watershed (1995-2005)

Watershed	Loading	Sediment	Total Copper	Total Lead	Total Zinc	Total DDT	Total PAH	Total PCB
Dominguez Channel	% of Total Loading	0.70%	2.60%	0.90%	0.90%	7.70%	6.80%	1.80%
Dominguez Channel	Average Daily Load (kg/day)	8.57E+01	2.56E-01	3.48E-02	5.65E-01	1.90E-05	7.06E-02	1.06E-05
Los Angeles River	% of Total Loading	19.00%	48.70%	19.80%	30.40%	83.00%	62.70%	97.10%
Los Angeles River	Average Daily Load (kg/day)	2.27E+03	4.69E+00	7.86E-01	1.90E+01	2.01E-04	6.39E-01	5.59E-04
San Gabriel River	% of Total Loading	80.10%	40.80%	72.90%	62.60%	9.30%	30.40%	1.10%
San Gabriel River	Average Daily Load (kg/day)	1.01E+04	4.18E+00	3.07E+00	4.15E+01	2.38E-05	3.29E-01	6.43E-06
Nearshore Watershed	% of Total Loading	0.10%	8.00%	6.50%	6.20%	0.00%	0.00%	0.00%
Nearshore Watershed	Average Daily Load (kg/day)	1.54E+01	7.78E-01	2.59E-01	3.89E+00	2.88E-10	4.18E-05	1.45E-10

The EFDC was used to model hydrodynamics and water and sediment quality of the greater Los Angeles and Long Beach Harbor waters. The EFDC model applied a simulated time period of 2002-2005. The model was calibrated with numerous sediment monitoring studies, including Los Angeles and Long Beach Harbor's 2006 sediment characterization study, which yielded sediment, porewater and overlying water concentrations as well as results from highly sensitive monitoring devices for detecting DDT, PCBs, and PAHs in the water column. The EFDC model also considered ocean water (outside breakwater) conditions and fine and coarse sediment transport and deposition. Ultimately the EFDC model was integrated with LSPC output – hourly for three watersheds, daily for nearshore watersheds – to model metals, PAHs, PCBs, and DDT (total) sediment concentrations in the receiving waters. The annual total (clean) sediment deposition rate for the top 5 cm (active sediment layer) was multiplied by the corresponding existing sediment pollutant level or the TMDL sediment quality target to yield pollutant load within each waterbody.

Table 8 Annual (clean) Sediment Deposition Rates per (salt) Waterbody

Waterbody Name	TMDL Zone	Area (acres)[1]	Area (m^2)[1]	Total Deposition (kg/yr)[2]
Dominguez Channel Estuary	01	140	567,900	2,470,201
Consolidated Slip	02	36	147,103	355,560
Inner Harbor - POLA	03	1,539	6,228,431	1,580,809
Inner Harbor - POLB	08	1,464	5,926,130	674,604

Waterbody Name	TMDL Zone	Area (acres)[1]	Area (m^2)[1]	Total Deposition (kg/yr)[2]
Fish Harbor	04	91	368,524	30,593
Cabrillo Marina	05	77	310,259	38,859
Cabrillo Beach	06	82	331,799	27,089
Outer Harbor - POLA	07	1,454	5,885,626	572,349
Outer Harbor - POLB	09	2,588	10,472,741	1,828,407
Los Angeles River Estuary	10	207	837,873	21,610,283
San Pedro Bay	11	8,173	33,073,517	19,056,271

[1] Area obtained from GIS layer of the 2006 303(d) list. Available at: Link to GIS layer of the 2006 303(d) list

[2] Sediment deposition rates were calculated by approximating the average mass of total sediment (fine and coarse particles) deposited in each waterbody annually based on 2002-2005 EFDC output. Sediment flux for each grid cell, which is dependent on watershed inputs as well as tidal movements between waterbodies, was obtained from the EFDC model output. These values were summarized across each TMDL waterbody, resulting in the average deposition of both sediment fines and sand by waterbody. The total deposition rate is simply the sum of the rates for fines and sand and this value is the waterbody-specific average annual (clean) sediment deposition rate.

The EFDC model was used to evaluate several management scenarios and relative contributions from various inputs to support water quality management decisions in Dominguez Channel and Greater Los Angeles and Long Beach Harbor waters. Preliminary results for two scenarios indicate that reducing freshwater input loads may not be sufficient to achieve target concentrations in water and sediments; thus reductions in contaminant levels in bed sediments may be required.

5. Additional Fish and Sediment Linkage Analysis

Water Resources Action Plan (WRAP) Model and a bioaccumulation model specific to the Greater ~~Harbor~~ Los Angeles and Long Beach Harbor Waters.

5.1 WRAP Model

The ~~Water Resources Action Plan (~~WRAP~~)~~ Model is a three-dimensional (3D) hydrodynamic, sediment transport, and chemical fate model that simulates the movement of organic chemicals, including total PCBs and DDTs, in the Greater Los Angeles and Long Beach Harbor Waters, accounting for ongoing stormwater discharges from four major watersheds (Los Angeles River, San Gabriel River, Dominguez Channel, and Nearshore watersheds), tidal exchange between TMDL receiving waterbodies, and re-suspension of existing contaminated sediments caused by fluvial and tidal currents and vessel traffic. The WRAP Model shows that organic chemicals in the harbor waters are primarily affected by ocean concentrations, existing sediment bed concentrations, and watershed loadings to the Greater Los Angeles and Long Beach Harbor Waters.

5.2 Bioaccumulation Model

The bioaccumulation model is a site-specific model that predicts the transfers of PCBs and DDTs within the Greater Harbor Los Angeles and Long Beach Harbor Waters food web to targeted fish species. The bioaccumulation model accounts for fish movement, food web structure, site specific diet, lipid content and growth rate of organisms. The model relies on the AQFDCHN model framework and has been modified to represent the Harbor food web structure for target fish species and migration of fish among subareas of the Harbor and Palos Verdes Shelf. The model was also calibrated using site data collected as part of the Ports' special studies and literature-based values.

5.3 Linked Model Evaluations

The linked model combines the WRAP and Bioaccumulation models to determine the linkage between PCBs and DDTs sources (water, sediment, and food) and PCBs and DDTs concentration in fish tissue. Water column and sediment concentrations estimated from WRAP model simulations provide inputs to the Bioaccumulation model. Water column and sediment bed concentrations were averaged over the fish movement zones to provide continuous time series of exposure concentrations for the bioaccumulation model. The output of the linked model consists of daily averaged concentrations within fish movement zones.

The linked model was used to support the Tier 3 Human Health SQO assessment, per the SQPs, of the Greater Los Angeles and Long Beach Harbor Waters to determine the current sediment conditions. The Greater Los Angeles and Long Beach Harbors responsible parties shall ~~perform and re-evaluate the Tier 3 Human Health SQO assessment~~ re-run the linked model with updated inputs and re-evaluate the results every five years ~~with updated information including but not limited to monitoring data, fish movement, and site-specific diet and fish consumption.~~ Responsible parties should consider which model input variables (e.g., fish movement, site-specific diet, and fish consumption data) need to be updated. Justifications for any updates or decisions not to update the model inputs should be addressed in the Monitoring and Reporting Plan to be approved by the Executive Officer.

The linked model can also be used to evaluate potential management scenarios to attain TMDL targets and to perform long-term model simulations to evaluate the effectiveness of specific management alternatives to reduce fish tissue concentration in the Greater Los Angeles and Long Beach Harbor Waters. The linked model was used to set the implementation schedule for attainment of the Human Health SQOs.

6. Loading Capacity

The ~~L~~loading capacity was calculated for both Dominguez Channel (wet weather) and in the Dominguez Channel Estuary and Greater Harbor waters (dry and wet weather).

Dominguez Channel wet weather metals TMDLs:

During wet weather, the loading capacity is a function of the volume of water in the Channel. Given the variability in wet-weather flows, the concept of a single critical flow was not justified. Instead, a load duration curve approach was used to establish the wet-weather loading capacity. The load duration curve was developed by multiplying the wet-weather flows by the in-stream numeric targets. The resulting curves identify the allowable load for a given flow. The wet-weather TMDLs for copper and zinc are defined by these load duration curves.

Loading capacities were calculated by multiplying the daily volume by the appropriate numeric water quality target or, in the case of lead, the observed existing average concentration. The wet-weather loading capacity applies to any day when the maximum daily flow measured at a location within the Dominguez Channel is equal to or greater than 62.7 cfs, which is the 90th percentile of annual flow rates from estimated/modeled flow rates.

The freshwater toxicity TMDL is equal to 1 TUc.

Dominguez Channel Estuary and Greater Harbor waters, metals and organics in sediment TMDLs:

Loading capacities for Dominguez Channel Estuary and Greater Harbor waters were calculated by estimating the sediment load (based on modeled sediment deposition rates) multiplied by the sediment quality targets (ERLs or FCG-derived targets, whichever are lower). The active sediment layer was defined as the top 5 cm of sediment; the habitat of approximately 95% of benthic organisms.

In addition, chlordane, dieldrin, toxaphene and mercury TMDLs were defined for specific waterbodies as equivalent to the concentration-based sediment quality target.

~~6~~7. Waste Load and Load Allocations

Final waste load allocations (WLA) are assigned to stormwater dischargers (MS4, California Department of Transportation (Caltrans), general construction and general industrial dischargers), and other NDPES dischargers. Final load allocations (LAs) are assigned to direct atmospheric deposition and bed sediments in both wet and dry weather. Dominguez Channel freshwater allocations are set for wet weather only because exceedances have only been observed in wet weather. Mass-based allocations have been set where sufficient data was available to calculate mass-based allocations, otherwise, concentration-based allocations have been set.

Interim WLA and LA are intended to not allow any decrease in current facility performance. Interim allocations shall be met upon the effective date of the TMDL.

Interim and final WLAs and LAs shall be included in permits and/or other Board orders in accordance with state and federal regulations and guidance.

~~6~~7.1 Interim Allocation

7~~6~~.1.1 Dominguez Channel Freshwater Interim Allocations in Waters~~s~~

A. Freshwater Toxicity Interim Allocation wet weather only: An interim allocation of 2 TUc applies to each source, including all point sources assigned a WLA and all nonpoint sources assigned a LA. The freshwater toxicity interim allocation is set at 2 TUc based on current monitoring results performed by the Los Angeles County Department of Public Works, which have shown average values of less than 2 TUc. The fresh water interim allocation shall be implemented as a trigger requiring initiation and implementation of the TRE/TIE process as outlined in US EPA's "Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the National Pollutant Discharge Elimination System Program" (2000) and current NPDES permits. The fresh water interim allocation shall be implemented in accordance with US EPA, State Board and Regional Board resolutions, guidance and policy at the time of permit issuance, modification or renewal.

B. Freshwater Metals Interim Allocations - wet weather only: Interim water allocations are assigned to stormwater dischargers (MS4, Caltrans, general construction and general industrial stormwater dischargers) and other NPDES dischargers. Interim water allocations are based on the 95th percentile of total metals data collected from January 2006 to January 2010 using a log-normal distribution. The use of 95th percentile values to develop interim allocations is consistent with NPDES permitting methodology. Regardless of the interim allocations below, permitted dischargers shall ensure that effluent concentrations and mass discharges do not exceed levels that can be attained by performance of the facility's treatment technologies existing at the time of permit issuance, reissuance or modification.

Table 9 Interim Concentration-based Freshwater WLAs for Metals in Water for Dominguez Channel and Torrance Lateral ~~freshwater interim metal allocations~~

Unit	Total Copper	Total Lead	Total Zinc
A~~a~~llocation (µg/L)	207.51	122.88	898.87

7.1.2 Dominguez Channel Estuary and Greater ~~Los Angeles and Long Beach~~ Harbor Waters Interim Allocations:

Interim concentration-based sediment allocations are assigned to stormwater dischargers (MS4, Caltrans, general construction and general industrial stormwater dischargers) and other NPDES dischargers. Interim sediment allocations are based on the 95th percentile of sediment data collected from 1998-2006. The use of 95th percentile values to develop interim allocations is consistent with NPDES permitting methodology. For waterbodies where the 95th percentile value has been equal to, or lower than, the numeric target, then the interim allocation is set equal to the final

allocation. Regardless of the interim sediment allocations below, permitted dischargers shall ensure that effluent concentrations and mass discharges do not exceed levels that can be attained by performance of the facility's treatment technologies existing at the time of permit issuance, reissuance or modification.

Table 10 Interim Concentration-based ~~Sediment, interim concentration-based allocations~~ WLAs in Sediment for Dominguez Channel Estuary and Greater Harbor Waters (mg/kg sediment)

Waterbody	Copper	Lead	Zinc	DDT	PAHs	PCBs
Dominguez Channel Estuary	220.0	510.0	789.0	1.727	31.60	1.490
Long Beach Inner Harbor	142.3	50.4	240.6	0.070	4.58	0.060
Los Angeles Inner Harbor	154.1	145.5	362.0	0.341	90.30	2.107
Long Beach Outer Harbor (inside breakwater)	67.3	**46.7**	**150**	0.075	**4.022**	0.248
Los Angeles Outer Harbor (inside breakwater)	104.1	**46.7**	**150**	0.097	**4.022**	0.310
Los Angeles River Estuary	53.0	**46.7**	183.5	0.254	4.36	0.683
San Pedro Bay Near/Off Shore Zones	76.9	66.6	263.1	0.057	**4.022**	0.193
Los Angeles Harbor - Cabrillo Marina	367.6	72.6	281.8	0.186	36.12	0.199
Los Angeles Harbor - Consolidated Slip	1470.0	1100.0	1705.0	1.724	386.00	1.920
Los Angeles Harbor - Inner Cabrillo Beach Area	129.7	**46.7**	163.1	0.145	**4.022**	0.033
Fish Harbor	558.6	116.5	430.5	40.5	2102.7	36.6

Numbers in **bold** are also the final allocation.

Compliance with the interim concentration-based sediment allocations may be demonstrated via any one of four~~three~~ different means:

1. Demonstrate that the sediment quality condition is such that aquatic life and human health protection is assessed as i) Unimpacted, Likely Unimpacted, and no station within the site is assessed as clearly impacted, and ii) the total percent area categorized as Possibly Impacted and/or Likely Impacted is less than 15% of the assessment site area and no station within the site is assessed as Clearly Impacted, as defined in the SQP. The demonstration shall be made with Assessment Units as specified in section ~~J~~10, Monitoring Plan~~Demonstrate that the sediment quality condition of **Unimpacted** or **Likely Unimpacted** via the interpretation and integration of multiple lines of evidence as defined in the SQO Part 1, is met~~; ~~or~~

2. Meet the interim allocations in bed sediment over a three-year averaging period; ~~or~~

3. Meet the interim allocations in the discharge over a three-year averaging period~~.~~; or

4. For irregular non-MS4~~Intermittent~~ dischargers only, ~~can demonstrate compliance with interim sediment limits by complying with performance-based~~ meet water column effluent limits determined at the time of permit renewal.

~~6~~7.2 Final Allocations

~~6~~7.2.1 Dominguez Channel Freshwater Allocations in Water

A. Freshwater Toxicity Allocation in wet weather: A final allocation of 1 TUc, or its equivalent based on any Statewide Toxicity Policy, applies to each source, including all point sources assigned a WLA and all nonpoint sources assigned a LA.

B. Freshwater Metals Allocations in wet weather: Wet-weather allocations are assigned to Dominguez Channel and all upstream reaches and tributaries of Dominguez Channel (above Vermont Avenue). Allocations are assigned to both point (WLA) and nonpoint sources (LA). A mass-based LA has been developed for direct atmospheric deposition. A mass-based ~~waste load allocation (~~WLA~~)~~ is divided between the MS4 permittees and Caltrans under its NPDES stormwater permit by subtracting the other stormwater or NPDES waste load allocations, air deposition and the margin of safety from the total loading capacity. Concentration-based WLAs are assigned for the other point sources including but not limited to General Construction, General Industrial, Power Generating stations, minor permits and irregular dischargers, and other NPDES dischargers.

Table 11 Final Freshwater Mass-based WLAs in Water for Dominguez Channel in Wet-weather ~~Final Allocations~~

Allocations	Total Copper (g/day)	Total Lead (g/day)	Total Zinc (g/day)
TMDL	1,485.1	6,548.8	10,685.5
WLAs for MS4 – LA County Permittees	1,300.3	5,733.7	9,355.5
WLAs for MS4 - Caltrans	32.3	142.6	232.6
LAs for Air Deposition	4.0	17.7	28.9
MOS (10%)	148.5	654.9	1,069.6

Based on total recoverable metal targets, a hardness of 50 mg/L, and 90th percentile of annual flow rates (62.7 cfs) in Dominguez Channel. Recalculated mass-based allocations using ambient hardness and flow rate at the time of sampling are considered consistent with the assumptions and requirements of these waste load allocations. In addition to the wasteload allocations above, samples collected during flow conditions less than the 90th percentile of annual flow rates must demonstrate that the acute and chronic hardness dependent water quality criteria provided in the CTR are achieved.

Table 12 Final Freshwater Concentration-based WLAs in Water for Dominguez Channel in Wet-weather Final Allocations (µg/L)

Dischargers	Total Copper	Total Lead	Total Zinc
Other stormwater/NPDES	9.7	42.7	69.7

Based on hardness = 50 mg/L. Recalculated concentration-based allocations using ambient hardness at the time of sampling are considered consistent with the assumptions and requirements of these waste load allocations. In addition to the wasteload allocations above, samples collected during flow conditions less than the 90th percentile of annual flow rates must demonstrate that the acute and chronic hardness dependent water quality criteria provided in the CTR are achieved.

67.2.2 Torrance Lateral Freshwater and Sediment Allocations in Water and Sediment

Torrance Lateral is a subwatershed that flows directly into Dominguez Channel Estuary. Allocations are assigned to the ExxonMobil Torrance Refinery and all other point and nonpoint source dischargers. Specific Mmass-based sediment allocations are assigned to the ExxonMobil Torrance Refinery. This allocation has been developed based on an average discharge frequency of once every 7 years. If, at the end of Phase I of implementation, due to an increase in discharge frequency or volumes, it appears that the allocations are not supportive of the TMDL, these allocations may be revised. Concentration-based Swater and sediment waste load allocations are assigned to all other dischargers to Torrance Lateral equal to the concentration-based sediment targets.

Table 13 Final Freshwater Concentration-based WLAs in Wet Weather and Sediment Concentration -based WLAs for Torrance Lateral ~~Wet-weather Waste Load Allocations and Sediment Waste Load Allocations, concentration-based~~

Media	Total Copper	Total Lead	Total Zinc
Water (unfiltered) (µg/L)	9.7	42.7	69.7
Sediment (mg/kg dry)	31.6	35.8	121

Hardness = 50 mg/L. Recalculated concentration-based allocations using ambient hardness at the time of sampling are considered consistent with the assumptions and requirements of these waste load allocations. In addition to the wasteload allocations above, samples collected during flow conditions less than the 90th percentile of annual flow rates must demonstrate that the acute and chronic hardness dependent water quality criteria provided in the CTR are achieved.

Table 14 Final Freshwater Mass-based WLAs ~~Waste Load Allocations~~in Water ~~Sediment~~ for ExxonMobil Torrance Refinery Discharges into Torrance Lateral~~, mass-based~~

Media	Total Copper	Total Lead	Total Zinc
Water (unfiltered) (kg/yr)	1.36	5.98	9.75

Based on Q = 3.7 MGD for 7 days/year; and total metals targets
No allocation for PAHs is assigned to ExxonMobil; however, discharges should not exceed existing water quality criteria for those compounds and monitoring shall continue.

Compliance with the freshwater metals allocations for Dominguez Channel and Torrance Lateral may be demonstrated via any one of three different means:

a. Final allocations are met.

b. CTR total metals criteria are met instream.

c. CTR total metals criteria are met in the discharge.

~~6~~7.2.3 Dominguez Channel Estuary and Greater Harbor Waters Allocations

Concentration-based WLAs for Non-MS4 ~~p~~Point Ssources ~~in Dominguez Channel Estuary and Greater Harbor Waters (~~i~~Including Some ~~r~~Refineries) for Mmetals, PAHs, and Bbioaccumulative Ccompounds in Wwater.

Non-MS4 point sources such as General Construction, General Industrial, individual industrial permittees, including some refineries, power generating stations, minor permits and irregular dischargers into Dominguez Channel Estuary and Greater Harbor Waters are assigned concentration-based allocations for metals, PAHs, and bioaccumulative compounds in water. Mass-based WLA for other refineries based on appropriate data may be considered during the TMDL reconsideration. (Refineries which have provided discharge flow data along with monitoring results are assigned mass-based allocations, whereas ~~other refineries~~those that haven't are assigned concentration-based allocations because no discharge flow data has been provided.) Any future minor NPDES permits or enrollees under a general NPDES permit are also assigned the concentration-based waste load allocations. The allocations are ~~set~~ equal to the saltwater numeric targets for metals and ~~equal to the human health targets for the~~ organic compounds in the CTR. The averaging period for the concentration-based WLAs in water shall be consistent with that specified in the CTR and State

Implementation Policy (SIP), where applicable ~~regulation establishing the criterion or objective or relevant implementation guidance published by the establishing agency~~.

Table 15 Final ~~Receiving (salt) Water Column~~ Concentration-Based ~~Waste Load Allocations~~WLAs in Water for Dominguez Channel Estuary and Greater Harbor Waters

Constituents	Copper * (µg/L)	Lead* (µg/L)	Zinc* (µg/L)	PAHs (µg/L)	Chlordane (µg/L)	4,4'-DDT (µg/L)	Dieldrin (µg/L)	Total PCBs (µg/L)
Dominguez Channel Estuary	3.73	8.52	85.6	0.049**	0.00059	0.00059	0.00014	0.00017
Greater Harbor Waters	3.73	8.52	85.6	N/A	N/A	0.00059	N/A	0.00017

* Total Concentration-based WLAs for metals are converted from saltwater dissolved CTR criteria using CTR saltwater default translators.

** CTR human health criteria were not established for total PAHs. Therefore, the CTR criterion for individual PAHs of 0.049 µg/L is applied individually to benzo(a)anthracene, benzo(a)pyrene, and chrysene. The CTR criterion for Pyrene of 11,000 µg/L is assigned as an individual WLA to Pyrene. Other PAH compounds in the CTR shall be screened as part of the TMDL monitoring.

Mass-based Aallocations for Mmetals and PAHs ~~compounds~~ in Sediments

Mass-based WLAs for metals and PAHs in sediment are assigned to the Terminal Island Water Reclamation Plant (TIWRP) (based on current discharge volume) and other point sources that have sufficient discharge flow data. Municipal stormwater sources, including the Los Angeles, Long Beach, Caltrans and other MS4 co-permittees, are assigned a mass-based allocation for each permit in place at the time of TMDL adoption, depending on the waterbody. Discharges from the Port of Los Angeles (POLA) and Port of Long Beach (POLB) are grouped with the MS4 dischargers. Mass-based WLAs are applied as annual limits. Individual mass-based WLAs for an individual MS4 Permittee will be calculated based on its share, on an area basis, of the mass-based WLA or other approved approach available at the time final mass-based WLAs are in effect and incorporated into the permit. TMDLs and allocations were developed based on existing sediment concentrations in the active sediment layer defined herein as the top 5 cm of bed sediment concentrations.

Load Allocations are assigned to existing sediments and direct air deposition. All allocations assigned to point sources and non-point sources are subtracted from the loading capacity and the remaining allocatable amount is assigned to the bed sediments. Direct air deposition allocations have been set equal to existing load estimates for Cu, Zn and PAHs based on atmospheric monitoring results collected in 2006. The Pb air deposition allocation has been developed by using the SCAQMD air quality Pb criteria (2010) multiplied by the surface area of each waterbody to produce direct air deposition allocations. Future changes to Cu, Zn and PAH air quality criteria, other regulation such as brake pad requirements, or other improvement in air quality may allow for re-calculations of air deposition allocations in future revisions to the

TMDL. If, at some point in the future, a nonpoint source is considered subject to NPDES ~~or WDR~~ regulations, then the corresponding load allocation established herein may be considered a waste load allocation for purposes of implementation and enforcement through a permit or other Board order.

Air deposition allocations for copper and zinc are based on existing loads; by assuming no direct deposition reductions, this consumes or partially consumes the available loading capacity. As a result, copper and zinc load allocations for bed sediments are negative values, in Inner and Outer Harbor, indicating that copper and zinc loads must be reduced. (Each negative copper and zinc bed sediment allocation may alternatively be interpreted as zero, or not adversely affecting benthic organisms.) The amount of copper and zinc load reduction may be revised based on future monitoring results. If future air deposition studies show lower existing air deposition copper and zinc loads, or if future copper and zinc sediment characterization studies show lower bed sediment copper and zinc loads, then copper and zinc allocations may be adjusted.

The bed sediment LA is assigned to the City of Los Angeles (including the Port of Los Angeles), the City of Long Beach (including the Port of Long Beach) and the State Lands Commission. After remediation activities that address existing sediment contamination are complete and when LAs are attained, if bed sediments are recontaminated as a result of continued polluted discharge from the surrounding watersheds, the WLA compliance monitoring data will be used, along with other available information, to assess the relative contribution of watershed dischargers and determine their responsibility and allocations for secondary remediation activities.

Table 16 Final~~,~~ Mass-Based TMDLs and Allocations for Metals and PAHs in Sediment (Kg/year)

Waterbody/Allocations	Total Cu	Total Pb	Total Zn	Total PAHs
DC Estuary - TMDL	84	115.4	370.5	9.94
MS4- LA County et al. WLAs	22.4	54.2	271.8	0.134
MS4- City of Long Beach WLAs	0.6	1.52	7.6	0.0038
MS4- CalTrans WLAs	0.384	0.93	4.7	0.0023
Air Deposition LAs	4.6	0.031	33.2	0.051
Bed Sediments LAs	56.0	58.7	53.3	9.7
Current Load	327.6	457.9	1799.0	28.1
Overall reduction	74%	75%	79%	65%
Consolidated Slip - TMDL	12.1	16.6	53.3	1.43
MS4- LA County et al. WLAs	2.73	3.63	28.7	0.0058
MS4 CalTrans WLAs	0.043	0.058	0.5	0.00009
Air deposition LAs	1.2	0.008	8.6	0.013
Bed sediments LAs	8.13	12.9	15.57	1.41
Current Load	92.1	127.3	398.9	11.5
Overall reduction	87%	87%	87%	88%

Waterbody/Allocations	Total Cu	Total Pb	Total Zn	Total PAHs
Inner Harbor - TMDL	76.7	105.3	338.3	9.1
MS4- LA County et al. WALs	1.7	34.0	115.9	0.088
MS4 City of Long Beach WLAs	0.463	9.31	31.71	0.024
MS4 CalTrans WLAs	0.032	0.641	2.18	0.0017
Air deposition LAs	97.6	0.67	710	1.08
Bed sediments LAs	(23.1)	60.7	(521.3)	7.88
Current Load	178.4	105.9	542.1	3.524
Overall reduction	57%	1%	38%	0%
Outer Harbor - TMDL	81.6	112.1	360.1	9.7
MS4- LA County et al. WLAs	0.91	26.1	81.5	0.105
MS4 City of Long Beach WLAs	0.63	18.1	56.4	0.073
MS4 CalTrans WLAs	0.0018	0.052	0.162	0.00021
TIWRP WLA = POTW (CTR & MGD***)	80.4	183.6	1845	1.056
Air deposition LAs	17.9	0.9	108.1	1.5
Bed sediments LAs	(18.2)	(116)	(1731)	6.964
Current Load	119.0	66.7	403.4	0.626
Overall reduction	31%	0%	11%	0%
Fish Harbor - TMDL	1.04	1.43	4.59	0.123
MS4- LA County et al. (POLA) WLAs	0.00017	0.54	1.62	0.007
MS4 CalTrans WLAs	0.0000005	0.00175	0.0053	0.000021
Air deposition LAs	0.4	0.02	2.4	0.033
Bed sediments LAs	0.636	0.87	0.5	0.084
Current Load	1.43	0.60	4.2	0.003
Overall reduction	27%	0%	0%	0%
Cabrillo Marina -TMDL	1.32	1.81	5.8	0.156
MS4- LA County et al. (POLA) WLAs	0.0196	0.289	0.74	0.00016
MS4 CalTrans WLAs	0.00019	0.0028	0.007	0.0000016
Air deposition LAs	0.34	0.017	2.05	0.028
Bed sediments LAs	1.0	1.506	3.03	0.1285
Current Load	9.2	2.3	9.14	0.236
Overall reduction	86%	21%	36%	34%
San Pedro Bay - TMDL	648	890	2858	76.6
MS4- LA County et al. WLAs	20.3	54.7	213.1	1.76
MS4 City of Long Beach WLAs	137.9	372.2	1449.7	12.0
MS4 CalTrans WLAs	0.88	2.39	9.29	0.077
MS4 Orange County** WLAs	9.8	26.4	102.9	0.85

Waterbody/Allocations	Total Cu	Total Pb	Total Zn	Total PAHs
Air deposition	36	1.8	219	2.9
Bed sediments	442.9	432	865	59.0
Current Load	1251	1737	8167	3.63
Overall reduction	48%	49%	65%	0%
LA River Estuary - TMDL	735	1009	3242	86.9
LAR Estuary dischargers*	[Cu SQV]	[Pb SQV]	[Zn SQV]	[PAH SQV]
MS4- LA County et al.	35.3	65.7	242.0	2.31
MS4 City of Long Beach	375.8	698.9	2572.7	24.56
MS4 CalTrans	5.1	9.5	34.8	0.333
Air deposition	6.7	0.046	48.9	0.075
Bed sediments	311.8	235.0	343.0	59.6
Current Load	1612	2641	20096	8.72
Overall reduction	54%	62%	84%	0%

Note: Cu and Zn air deposition load allocations are set equal to existing load with no reductions anticipated. Negative (values) for bed sediments indicate that bed sediment loads are expected to be reduced; the amount of reduction may be revised with additional monitoring results.

*SQVs are currently set at ERLs

**Orange County MS4 Permit is issued by the Santa Ana Regional Board. The allocations included, here, for the Seal Beach nearshore area, are for TMDL calculation purposes only, and an allocation is not assigned.

***For TIWRP, the discharge volume at the time of permit modification or reissuance shall be used to calculate the mass-based effluent limitations consistent with the assumptions and requirements of these WLAs. Studies may be conducted to determine the portion of the discharged pollutants that is deposited on bed sediment. The results of any such Executive Officer approved studies shall be evaluated at the TMDL reconsideration to modify these WLAs as appropriate.

Concentration-based WLAs for Mercury, Cadmium, and Chromium in Sediment

Consolidated Slip and Fish Harbor are impaired for mercury in sediments and the average sediment concentration (1.1 mg/kg dry) is significantly higher than the target concentration (0.15 mg/kg dry). Consolidated Slip and Dominguez Channel Estuary are impaired for cadmium in sediments, and Consolidated Slip is also impaired for chromium in sediments.

Table 17 Final Concentration-Based ~~Sediment~~ WLAs for M~~m~~etals in Sediment for Dominguez Channel Estuary, Consolidated Slip and Fish Harbor (mg/kg dry sediment)

Cadmium	Chromium	Mercury
1.2	81	0.15

Mercury applies to both Consolidated Slip and Fish Harbor; Cd applies to Dominguez Channel Estuary and Consolidated Slip, and Cr applies to Consolidated Slip only.

Compliance with the~~se~~ mass-based and concentration-based allocations ~~sediment TMDLs~~ for Cu, Pb, Zn, Cd, Cr, Hg and total PAHs in sediment may be demonstrated via any one of three different means:

a. Final sediment allocations, as presented ~~above~~Tables 16~~7~~ and 17~~8~~, are met.

b. The qualitative sediment condition to protect the benthic community is assessed as i) Unimpacted, Likely Unimpacted, and no station within the site is assessed as Clearly Impacted and ii) the total percent area is categorized as Possibly Impacted and/or Likely Impacted is less than 15% of the assessment site area to protect aquatic life as defined in the SQP, with the exception of Cr, which is not included in the SQP. The demonstration shall be made with Assessment Units as specified in section ~~J~~10, Monitoring Plan~~The qualitative sediment condition of Unimpacted or Likely Unimpacted via the interpretation and integration of multiple lines of evidence as defined in the SQO Part 1, is met, with the exception of Cr, which is not included in the SQO Part 1~~.

c. Sediment numeric targets are met in bed sediments over a three-year averaging period.

Compliance with mass-based WLAs shall be measured at designated discharge points. Compliance with concentration-based WLAs ~~for existing sediment~~ shall be determined by pollutant concentrations in ambient sediment in each waterbody. The average ambient bulk sediment level within a waterbody at or below the sediment quality target is considered compliance with these TMDLs.

Mass-Based Allocations for Bioaccumulative Compounds in Sediment

Fish tissue levels of certain bioaccumulative compounds are above desired numeric targets. These TMDLs are designed to reduce contaminated sediment levels, which will result in lower corresponding pollutant levels in fish tissue. These sediment allocations have been derived to support lowering fish tissue levels using biota-sediment accumulation factors (BSAFs) or ERLs, whichever is more protective. For chlordane and dieldrin, the ERL values are lower and more protective than BSAF values. The DDT sediment values are comparable (ERL = 1.58, BSAF = 1.9); the more stringent one was used for calculation. The PCBs sediment value associated with fish tissue is more stringent than the ERL sediment value for PCBs.

Mass-based WLAs are assigned for TIWRP and other point sources that have sufficient discharge flow data. Municipal stormwater sources, including the Los Angeles, Long Beach, Caltrans and other MS4 co-permittees, are assigned a single, mass-based allocation by permit, depending on the waterbody. Discharges from the Port of Los Angeles (POLA) and Port of Long Beach (POLB) are grouped with the MS4 dischargers. Mass-based WLAs are applied as annual limits.

Individual mass-based WLAs for an individual MS4 Permittee will be calculated based on its share, on an area basis, of the mass based WLA or other approved approach available at the time final mass-based WLAs are in effect and incorporated into the permit. Mass-based LAs are identified for bed sediments and direct air deposition. Direct air deposition allocations for total DDT are based on estimates of existing loads using atmospheric monitoring results collected close to Los Angeles/Long Beach Harbor at SCAQMD Wilmington Station in 2006. Pollutant-specific air deposition values (DDT =

29 ng/m2/day) were multiplied by the surface area of each waterbody to produce direct deposition allocations. Direct deposition allocations for PCBs are not included since air deposition has been measured to be less than water-to-air fluxes.

DDT load allocations for bed sediments are negative values, with the exception of those for the Los Angeles River Estuary, indicating that DDT loads must be reduced. (Each negative DDT bed sediment allocation may alternatively be interpreted as zero, or interpreted as minimal bioaccumulation into the food web.) The amount of DDT load reduction may be revised based on future monitoring results. If future air deposition studies show lower existing air deposition DDT loads, or if future DDT sediment characterization studies show lower bed sediment DDT loads, then DDT load allocations may be adjusted.

The Greater Harbor Waters (excluding LA River Estuary and Consolidated Slip) bed sediment LA is assigned to the City of Los Angeles (including the Port of Los Angeles), the City of Long Beach (including the Port of Long Beach) and the State Lands Commission. After remediation activities that address existing sediment contamination are complete and when LAs are attained, if bed sediments are recontaminated as a result of continued polluted discharge from the surrounding watersheds, the WLA compliance monitoring data will be used, along with other available information, to assess the relative contribution of watershed dischargers and determine their responsibility and allocations for secondary remediation activities.

DDT and PCBs (total) TMDLs apply to all estuarine and marine waters in Greater Harbor area, including Inner Cabrillo Beach, Los Angeles River Estuary and Eastern San Pedro Bay.

Table 18 Final Mass-Based ~~TMDLs and~~ Allocations for Total DDT and Total PCBs in Sediment (g/yr)

Waterbody/Sources	Total DDT	Total PCBs
DC Estuary - TMDL	3.90	7.90
MS4- LA County et al. WLAs	0.250	0.207
MS4- City of Long Beach WLAs	0.007	0.006
MS4- CalTrans WLAs	0.004	0.004
Air Deposition LAs	6.01	n/a
Bed Sediments LAs	(2.4)	7.7
Current Load	54.0	57.5
Overall Reduction	93%	86%
Consolidated Slip - TMDL	0.56	1.14
MS4- LA County et al. WLAs	0.009	0.004
MS4 CalTrans WLAs	0.00014	0.00006
Air deposition LAs	1.56	n/a
Bed sediments LAs	(1.00)	1.13

Waterbody/Sources	Total DDT	Total PCBs
Current Load	49.0	83.9
Overall Reduction	99%	99%
Inner Harbor - TMDL	3.56	7.22
MS4- LA County et al. WALs	0.051	0.059
MS4 City of Long Beach WLAs	0.014	0.016
MS4 CalTrans WLAs	0.0010	0.0011
Air deposition LAs	129	n/a
Bed sediments LAs	(125)	7.14
Current Load	21.67	29.51
Overall reduction	84%	76%
Outer Harbor - TMDL	3.79	7.68
MS4- LA County et al. WLAs	0.005	0.020
MS4 City of Long Beach WLAs	0.004	0.014
MS4 CalTrans WLAs	0.000010	0.00004
TIWRP WLA = POTW (CTR & MGD***)	12.7	~~0.~~3.7
Air deposition LAs	173	n/a
Bed sediments LAs	(182)	7.28
Current Load	30.8	34.7
Overall reduction	88%	78%
Fish Harbor - TMDL	0.048	0.098
MS4- LA County et al. (POLA) WLAs	0.0003	0.0019
MS4 CalTrans WLAs	0.0000010	0.000006
Air deposition LAs	3.9	n/a
Bed sediments LAs	(3.85)	0.10
Current Load	0.168	0.075
Overall reduction	71%	0%
Cabrillo Marina -TMDL	0.061	0.124
MS4- LA County et al. (POLA) WLAs	0.000028	0.000025
MS4 CalTrans WLAs	0.00000028	0.00000024
Air deposition LAs	3.3	n/a
Bed sediments LAs	(3.22)	0.12
Current Load	1.66	1.06
Overall reduction	96%	88%
Inner Cabrillo Beach -TMDL	0.04	0.09
MS4- LA County et al. WLAs	0.0001	0.0003
Air deposition LAs	3.5	n/a

Waterbody/Sources	Total DDT	Total PCBs
Bed sediments LAs	(3.5)	0.09
Current Load	0.98	0.31
Overall reduction	96%	72%
San Pedro Bay - TMDL	30.1	61.0
MS4- LA County et al. WLAs	0.049	0.44
MS4 City of Long Beach WLAs	0.333	3.01
MS4 CalTrans WLAs	0.002	0.019
MS4 Orange County** WLAs	0.024	0.213
Air deposition	350	n/a
Bed sediments	(320)	57.3
Current Load	205.2	110.7
Overall reduction	85%	45%
LA River Estuary - TMDL	34.1	69.2
MS4- LA County et al	0.100	0.324
MS4 City of Long Beach	1.067	3.441
MS4 CalTrans	0.014	0.047
LAR Estuary dischargers	[DDT SQV]	[PCBs SQV]
Air deposition	8.9	n/a
Bed sediments	24.09	65.3
Current Load	231.6	402.2
Overall reduction	85%	83%

Note: DDT air deposition load allocation is set equal to existing load with no reductions anticipated. Negative values for bed sediments indicate that DDT bed sediment loads are expected to be reduced; the amount of reduction may be revised with additional monitoring results.

*SQVs are currently set at the more protective of ERLs or fish tissue associated sediment targets.

**Orange County MS4 Permit is issued by the Santa Ana Regional Board. The allocations included, here, for the Seal Beach nearshore area, are for TMDL calculation purposes only, and an allocation is not assigned.

***For TIWRP, the discharge volume at the time of permit modification or reissuance shall be used to calculate the mass-based effluent limitations consistent with the assumptions and requirements of these WLAs. Studies may be conducted to determine the portion of the discharged pollutants that is deposited on bed sediment. The results of any such Executive Officer approved studies shall be evaluated at the TMDL reconsideration to modify these WLAs as appropriate.

In addition, bed sediment concentration-based allocations are assigned for chlordane in Dominguez Channel Estuary, Consolidated Slip, Fish Harbor, Los Angeles River Estuary and Eastern San Pedro Bay. Bed sediment concentration-based allocations are also assigned for dieldrin in Dominguez Channel Estuary and Consolidated Slip. Bed sediment concentration allocations are also assigned for toxaphene in Consolidated Slip. The TMDLs and allocations are set at target sediment concentrations: chlordane = 0.5, dieldrin = 0.02, toxaphene = 0.10 µg/kg dry sediment.

Compliance with these bioaccumulative TMDLs may be demonstrated via any of four different means:

a. Fish tissue targets are met in species resident to the TMDL waterbodies.

b. Final sediment allocations, as presented above, are met.

c. Sediment numeric targets to protect fish tissue are met in bed sediments over a three-year averaging period.

d. The sediment quality condition to protect human health is assessed as Unimpacted, or Likely Unimpacted as defined in the SQP. The demonstration shall be made with the most recent site-specific sediment linkage and bioaccumulation model developed for the Greater Harbor Waters as specified in section ~~J~~10, Monitoring Plan~~Demonstrate that the sediment quality condition protective of fish tissue is achieved per the Statewide Enclosed Bays and Estuaries Plan, as amended to address contaminants in resident finfish and wildlife~~.

Diazinon

Los Angeles County monitoring data in Dominguez Channel freshwaters show diazinon ~~exceedences~~exceedances from 2002-2005, but none from 2006-2010. This timing is concurrent with EPA's ban on urban use of diazinon, effective Dec. 31, 2005. Based these results, no diazinon TMDLs are developed at this time.

~~7~~8. Margin of Safety

The Dominguez Channel freshwater allocations included an explicit margin of safety (MOS) equal to 10% of the loading capacity or existing load to account for any additional uncertainty in the wet-weather TMDLs. The 10% MOS was subtracted from the loading capacity or existing load, whichever was smaller. Applying an explicit margin of safety is reasonable because a number of uncertain estimates are offset by the explicit margin of safety. While the observed dissolved-to-total metals ratios are not similar to CTR default conversion values, there appears to be very poor correlation between the fraction of particulate metals and TSS. Also, there is added uncertainty regarding stream flow rates during wet weather conditions, when the highest metal loads occur, thus an explicit margin of safety is justified.

An implicit margin of safety exists in the final allocations to Dominguez Channel Estuary and Greater Harbor waters. The implicit margin of safety is based on the selection of multiple numeric targets, including targets for water, fish tissue and sediment among other conservative modeling assumptions. An additional explicit margin of safety must be considered and may be applied if any chemical-specific sediment quality target is revised or updated contingent on future sediment quality studies. That is, there may be uncertainty associated with revised sediment quality values, which may warrant including an additional explicit margin of safety.

~~8~~9. Seasonal Variations and Critical Conditions

Wet weather events may produce extensive sediment redistribution and transport sediments to the harbors and the CTR-based water column targets are protective of this condition. This would be considered the critical condition for loading.

No correlation with flow or seasonality (wet vs. dry season) was found to exist in sediment or tissue data. Given that allocations for this TMDL are expressed in terms pesticides, PCBs, PAHs, and metals concentrations in sediment, a critical condition is not identified based upon flow or seasonality.

Because the adverse effects of pesticides, PCBs, PAHs, and metals are related to sediment accumulation and bioaccumulation in the food chain over long periods of time, short term variations in concentrations are less likely to cause significant impacts upon beneficial uses.

~~9~~10. Monitoring Plan

Monitoring by assigned responsible parties is required in three waterbody areas:

1. Dominguez Channel, Torrance Lateral, and Dominguez Channel Estuary

2. Greater Los Angeles and Long Beach Harbor Waters (including Consolidated Slip)

3. Los Angeles River and San Gabriel River

Monitoring shall be conducted under technically appropriate Monitoring and Reporting Plans (MRPs) and Quality Assurance Project Plans (QAPPs). The MRPs shall include a requirement that the responsible parties report compliance and non-compliance with waste load and load allocations as part of annual reports submitted to the Los Angeles Regional Board. The QAPPs shall include protocols for sample collection, standard analytical procedures, and laboratory certification. All samples shall be collected in accordance with SWAMP protocols. Monitoring Plans shall be submitted twenty (20) months after the effective date of the TMDL for public review and, subsequently, Executive Officer approval.

Monitoring shall begin six months after the monitoring plan is approved by the Executive Officer. Responsible parties assigned both WLAs and LAs may submit one document that addresses the monitoring requirements (as described below) and implementation activities for both WLAs and LAs. Responsible parties shall submit annual monitoring reports.

The Los Angeles Regional Board Executive Officer may reduce, increase, or modify monitoring and reporting requirements, as necessary, based on the results of the TMDL monitoring program. Currently, several of the constituents of concern have numeric targets that are lower than the readily available detection limits. As analytical methods and detection limits continue to improve (i.e., development of lower detection limits) and

become more environmentally relevant, responsible parties shall incorporate new method detection limits in the MRP and QAPP.

~~9~~10.1 Dominguez Channel, Torrance Lateral, and Dominguez Channel Estuary Compliance Monitoring Program

For Dominguez Channel, Dominguez Channel Estuary, and Torrance Lateral, water and total suspended solids samples shall be collected at the outlet of the storm drains discharging to the channel and the estuary. Fish tissue samples shall be collected in receiving waters of the Dominguez Channel Estuary. Sediment samples shall also be collected in the estuary.

Water Column Monitoring

Water samples and total suspended solids samples shall be collected during two wet weather events and one dry weather event each year. The first large storm event of the season shall be included as one of the wet weather monitoring events. Water samples and total suspended solid samples shall be analyzed for a suite of compounds including, at a minimum, metals, including lead, zinc, and copper, DDT, PCBs, Benzo[a] anthrancene, Benzo[a]pyrene, Chrysene, Phenanthrene, and Pyrene. PCBs monitoring shall be required for 44 congeners using recommended EPA methods 8270 and 1668 or equivalent methods and should be reported with a target reporting limit of 10 to 20 pg/L. Sampling shall be designed to collected sufficient volumes of suspended solids to allow for analysis of the pollutants in the bulk sediment.

In addition to TMDL constituents, general water chemistry (temperature, dissolved oxygen, pH, and electrical conductivity) and a flow measurement will be required at each sampling event. General chemistry measurements may be taken in the laboratory immediately following sample collection, if auto samplers are used for sample collection or if weather conditions are unsuitable for field measurements. In addition, toxicity shall be tested for in the freshwater portion of Dominguez Channel.

Sediment Monitoring

A sediment monitoring program shall be developed consistent with the selected method for compliance and all samples shall be collected in accordance with SWAMP protocols.

a) If compliance will be determined based on achieving sediment quality targets, sediment chemistry samples shall be collected every two years for analysis of general sediment quality constituents and the full chemical suite as specified in the ~~SQO Part 1~~SQP. In addition, benthic community effects shall be assessed in the Dominguez Channel Estuary.

b) If compliance will be determined based on the SQO compliance method, sediment chemistry samples shall also be collected every five years (in addition

to, and in between, the benthic community and human health SQO ~~sediment triad~~ sampling events as described below), beginning after the first benthic community and human health SQO ~~sediment triad~~ event, to evaluate trends in general sediment quality constituents and listed constituents relative to sediment quality targets. Chemistry data without accompanying benthic community and human health SQO ~~sediment triad~~ data shall be used to assess sediment chemistry trends and shall not be used to determine compliance.

Sediment quality objective evaluation as detailed in the ~~SQO Part 1~~SQP (benthic community and human health SQO sampling) ~~(sediment triad sampling)~~ shall be performed every five years in coordination with the Biological Baseline and Bight regional monitoring programs, if possible. Sampling and analysis for the full chemical suite, two toxicity tests and four benthic indices as specified in ~~SQO Part 1~~the SQP shall be conducted and evaluated. If moderate toxicity as defined in the ~~SQO Part 1~~~~the~~ SQP is observed, results shall be highlighted in annual reports and further analysis and evaluation to determine causes and remedies shall be required in accordance with the EO approved monitoring plan. Locations for benthic community and human health SQO~~sediment triad~~ assessment and the methodology for combining results from sampling locations to determine sediment conditions including Assessment Units as defined by the SQPs shall be specified in the MRP to be approved by the Executive Officer. Responsible parties may use the nine Assessment Units developed by the Harbor Technical Working Group. The sampling design shall be in compliance with the ~~SQO Part 1~~SQP, Section IV.A 4. ~~Sediment Monitoring section (VII.E.).~~

When a benthic community SQO assessment finds an assessment site is Clearly Impacted or Likely Impacted, the responsible parties shall ensure the assessment site will be investigated via an addendum to a TMDL coordinated monitoring plan and the responsible parties shall determine if remedial actions are appropriate.

The addendum to a TMDL coordinated monitoring plan and proposed remedial actions under a Contaminated Sediment Management Plan shall be submitted to the Los Angeles ~~Water~~ Regional Board within 6 months of the Clearly Impacted or Likely Impacted assessment for Executive Officer approval. The Los Angeles Regional ~~Water~~ Board may issue a Cleanup and Abatement Order under the authority of Water Code 13304 if an insufficient CSMP is submitted or deemed necessary to direct responsible parties to remediate identified hot spots.

Fish Tissue Monitoring

Fish tissue samples shall be collected twice per 5 years (no more than 3 years between sampling events) ~~every two years~~ from the Dominguez Channel Estuary and analyzed for chlordane, dieldrin, toxaphene, DDT, and PCBs. The target species in the Dominguez Channel Estuary shall be selected based on residency,

local abundance and fish size at the time of field collection. Tissues analyzed shall be based on the most common preparation for the selected fish species.

The Dominguez Channel responsible parties are each individually responsible for conducting water, sediment, and fish tissue monitoring. However, they are encouraged to collaborate or coordinate their efforts to avoid duplication and reduce associated costs. Dischargers interested in coordinated monitoring shall submit a coordinated MRP that identifies monitoring to be implemented by the responsible parties. Under the coordinated monitoring option, the compliance point for the stormwater WLAs shall be storm drain outfalls or a point(s) in the receiving water that suitably represents the combined discharge of cooperating parties.

The details of the monitoring program including sampling locations and all methods shall be specified in the MRP to be approved by the Executive Officer.

~~9~~10.2 Greater Los Angeles and Long Beach Harbor Waters Compliance Monitoring Program

At a minimum, compliance monitoring shall be conducted at the locations and for the constituents listed in the table below for water column, total suspended solids, and sediment. The exact locations of monitoring sites shall be specified in the MRP to be approved by the Executive Officer. During aspects of the remedial action(s) for the Montrose Superfund Site that may mobilize sediments and associated pollutants from the on- or near-property soils or "Neighborhood Areas", it is recommended that US EPA, as the regulatory oversight agency, require that Potentially Responsible Parties (PRP) implement monitoring to evaluate pollutant loads and concentrations leaving the site and surrounding area, as well as pollutant concentrations in the bed sediments of Dominguez Channel Estuary and Consolidated Slip and coordinate such monitoring with other TMDL compliance monitoring.

Water Column Monitoring

Water samples and total suspended solids samples shall be collected during two wet weather events and one dry weather event each year. TSS shall be collected at several depths during wet weather events. Water samples and total suspended solid samples shall be analyzed for a suite of compounds including, at a minimum, metals, including lead, zinc, and copper, DDT, PCBs, Benzo[a] anthrancene, Benzo[a]pyrene, Chrysene, Phenanthrene, and Pyrene. PCBs monitoring shall be required for 44 congeners using recommended EPA methods 8270 and 1668 or equivalent methods, and should be reported with a target reporting limit of 10 to 20 pg/L. The first large storm event of the season shall be included as one of the wet weather monitoring events. General water chemistry (temperature, dissolved oxygen, pH, and salinity) and a flow measurement shall be required at each sampling event.

Sediment Monitoring

Sediment chemistry samples shall be collected every five years (in addition to, and in between, the benthic community and human health SQO ~~sediment triad~~ sampling events as described below), beginning after the ~~first sediment triad event~~ benthic community and human health SQO event, to evaluate trends in general sediment quality constituents and listed constituents relative to sediment quality targets. Chemistry data without accompanying benthic community and human health SQO~~sediment triad~~ data shall be used to assess sediment chemistry trends and shall not be used to determine compliance.

Table 19 Sediment chemistry monitoring requirements

Water Body Name	Station ID	Station Location	Water/TSS	Sediment
Consolidated Slip	01	Center of Consolidated Slip	Metals, PCBs, DDT	Metals, Chlordane, DDT PCBs, PAHs
Los Angeles Inner Harbor	02	East Turning Basin	Metals, PCBs, DDT	Metals, Toxicity, Benthic Community Effect
Los Angeles Inner Harbor	03	Center of the POLA West Basin	Metals, PCBs, DDT	Metals, Toxicity, Benthic Community Effect
Los Angeles Inner Harbor	04	Main Turning Basin north of Vincent Thomas Bridge	Metals, PCBs, DDT	Metals, Toxicity, Benthic Community Effect
Los Angeles Inner Harbor	05	Between Pier 300 and Pier 400	Metals, PCBs, DDT	Metals, Toxicity, Benthic Community Effect
Los Angeles Inner Harbor	06	Main Channel south of Port O'Call	Metals, PCBs, DDT	Metals, Toxicity, Benthic Community Effect
Fish Harbor	07	Center of inner portion of Fish Harbor	Metals, PCBs, DDT	Metals, Toxicity, PCBs, DDT, Chlordane, PAHs
Los Angeles Outer Harbor	08	Los Angeles Outer Harbor between Pier 400 and middle breakwater	Metals, PCBs, DDT	Toxicity
Los Angeles Outer Harbor	09	Los Angeles Outer Harbor between the southern end of the reservation point and the San Pedro breakwater	Metals, PCBs, DDT	Toxicity
Cabrillo Marina	10	Center of west Channel	Metals, PCBs, DDT	
Inner Cabrillo Beach	11	Center of Inner Cabrillo Beach	Metals, PCBs, DDT	Metals
Long Beach Inner Harbor	12	Cerritos Channel between the Heim	Metals, PCBs, DDT	Metals, Toxicity, Benthic Community Effect

Water Body Name	Station ID	Station Location	Water/TSS	Sediment
		Bridge and the Turning Basin		
Long Beach Inner Harbor	13	Back Channel between Turning Basin and West Basin	Metals, PCBs, DDT	Metals, Toxicity, Benthic Community Effect
Long Beach Inner Harbor	14	Center of West Basin	Metals, PCBs, DDT	Metals, Toxicity, Benthic Community Effect
Long Beach Inner Harbor	15	Center of Southeast Basin	Metals, PCBs, DDT	Metals, Toxicity, Benthic Community Effect
Long Beach Outer Harbor	16	Center of Long Beach Outer Harbor	Metals, PCBs, DDT	Toxicity
Long Beach Outer Harbor	17	Between the southern end of Pier J and the Queens Gate	Metals, PCBs, DDT	Toxicity
San Pedro Bay	18	Northwest of San Pedro Bay near Los Angeles River Estuary	Metals, PCBs, DDT	Metals, Chlordane, PAHs, Toxicity
San Pedro Bay	19	East of San Pedro Bay	Metals, PCBs, DDT	Metals, Chlordane, PAHs, Toxicity
San Pedro Bay	20	South of San Pedro Bay inside breakwater	Metals, PCBs, DDT	Metals, Chlordane, PAHs, Toxicity
Los Angeles River Estuary	21	Los Angeles River Estuary Queensway Bay	Metals, PCBs, DDT	Metals, Chlordane, DDT, PCBs
Los Angeles River Estuary	22	Los Angeles River Estuary	Metals, PCBs, DDT	Metals, Chlordane, DDT, PCBs

Sediment quality objective evaluation as detailed in the SQP ~~SQO Part 1~~ (benthic community and human health SQO~~sediment triad~~ sampling) shall be performed every five years in coordination with the Biological Baseline and Bight regional monitoring programs, if possible. Sediments collected from each station or site-specific assessment unit shall be tested and assessed using the methods and metrics described in Chapter IV.A.1. through VI.A.3 of the SQPs for benthic community and human health sediment quality objective evaluations~~Sampling and analysis for the full chemical suite, two toxicity tests and four benthic indices as specified in SQO Part 1 shall be conducted and evaluated~~. If moderate toxicity as defined in the SQP ~~SQO Part 1~~ is observed, results shall be highlighted in annual reports and further analysis and evaluation to determine causes and remedies shall be required in accordance with the EO approved monitoring plan. Locations for benthic community and human health SQO ~~sediment triad~~ assessment and the Assessment Units as defined by the SQPs ~~methodology for combining results from~~

~~sampling locations to determine sediment conditions~~ shall be specified in the MRP to be approved by the Executive Officer. Responsible parties may use the Assessment Units developed by the Harbor Technical Working Group for benthic community and human health SQO assessments. The sampling design shall be in compliance with the ~~SQO Part 1~~SQP ~~Sediment Monitoring section (VII.E.).~~ Section IV.A.4.

For human health SQO assessments, the sediment linkage determination shall be conducted based on updated monitoring data using the most recent site-specific sediment linkage and bioaccumulation model developed for the Greater Harbor Waters. Adjustments or modifications to the site-specific sediment linkage and bioaccumulation model shall be specified in the MRP to be approved by the Executive Officer.

When a benthic community SQO assessment finds a site is Clearly Impacted or Likely Impacted, the responsible parties shall ensure the site will be investigated via an addendum to a TMDL coordinated monitoring plan and the responsible parties shall determine if remedial actions are appropriate.

The addendum to a TMDL coordinated monitoring plan and proposed remedial actions shall be submitted to the Los Angles Water Board within 6 months of the Clearly Impacted or Likely Impacted assessment for Executive Officer approval. The Los Angeles Regional ~~Water~~ Board may issue a Cleanup and Abatement Order under the authority of Water Code 13304 if an insufficient CSMP is submitted; or deemed necessary to direct responsible parties to remediate identified hot spots.

Fish Tissue Monitoring

Fish tissue samples shall be collected twice per 5 years (no more than 3 years between sampling events) ~~every two years~~ in San Pedro Bay, Los Angeles Harbor, and Long Beach Harbor, and analyzed for chlordane, dieldrin, toxaphene, DDT, and PCBs. For human health SQO assessments ~~sediment quality objective evaluations~~, fish tissue samples collected from each station or site-specific assessment unit shall be tested and assessed using the methods and metrics described in Chapter IV.A.1. through VI.A.3 of the SQPs. Responsible parties may use the Assessment Units developed by the Harbor Technical Working Group for human health SQO assessment. At a minimum, three species shall be collected, including white croaker, a sport fish, and a prey fish.

The Greater Los Angeles and Long Beach Harbors[3] responsible parties are each individually responsible for conducting water, sediment, and fish tissue monitoring.

[3] Greater Los Angeles/Long Beach Harbor waters include Inner and Outer Harbor, Main Channel, Consolidated Slip, Southwest Slip, Fish Harbor, Cabrillo Marina, Inner Cabrillo Beach, Los Angeles River estuary, and San Pedro Bay.

However, they are encouraged to collaborate or coordinate their efforts to avoid duplication and reduce associated costs. Dischargers interested in coordinated compliance monitoring shall submit a coordinated MRP that identifies monitoring to be conducted by the responsible parties. Under the coordinated compliance monitoring option, the compliance point for the stormwater WLAs shall be storm drain outfalls or a point(s) in the receiving water that suitably represents the combined discharge of cooperating parties.

The Consolidated Slip sub-group responsible parties are responsible for conducting water, sediment, and fish tissue monitoring in Consolidated Slip.

The details of the monitoring program including sampling locations and all methods shall be specified in the MRP to be approved by the Executive Officer.

~~9~~10.3 Los Angeles River and San Gabriel River Compliance Monitoring Program

Los Angeles River Watershed and San Gabriel River Watershed responsible parties identified in effective metals TMDLs for Los Angeles River and San Gabriel River are responsible for conducting water and sediment monitoring above the Los Angeles River Estuary and at the mouth of the San Gabriel River, respectively, to determine the Rivers' contribution to the impairments in the Greater Harbor waters.

Water Column Monitoring

Water samples and total suspended solids samples shall be collected at, at least one site during two wet weather events and one dry weather event each year. The first large storm event of the season shall be included as one of the wet weather monitoring events. Water samples and total suspended solid samples shall be analyzed for metals, DDT, PCBs, and PAHs. Sampling shall be designed to collect sufficient volumes of suspended solids to allow for analysis of the listed pollutants in the bulk sediment. PCBs monitoring shall be required for 44 congeners using recommended EPA methods 8270 and 1668 or equivalent method and shall be reported with a target reporting limit of 10 to 20 pg/L.

General water chemistry (temperature, dissolved oxygen, pH, and electrical conductivity) and a flow measurement shall be required at each sampling event. General chemistry measurements may be taken in the laboratory immediately following sample collection if auto samplers are used for sample collection or if weather conditions are unsuitable for field measurements.

Sediment Monitoring

For sediment chemistry, sediment samples shall be collected at, at least one site every two years for analysis of general sediment quality constituents and the full chemical suite as specified in ~~SQO Part 1~~the SQP. All samples shall be collected in accordance with SWAMP protocols.

The details of the monitoring program including sampling locations and all methods shall be specified in the MRP to be approved by the Executive Officer.

~~10~~11. Implementation Plan

The regulatory mechanisms to implement the TMDL include, but are not limited to, general NPDES permits, individual NPDES permits, MS4 Permits covering jurisdictions and flood control districts within these waters, the Statewide Industrial Storm Water General Permit, the Statewide Construction Activity Storm Water General Permit, the Statewide Stormwater Permit for Caltrans Activities, and the authority contained in Sections 13263, 13267 and 13383 of the Cal. Water Code. The Los Angeles Regional ~~Water~~ Board may issue a Cleanup and Abatement Order under the authority of Water Code 13304 if necessary to direct responsible parties to remediate identified hot spots (existing or identified through SQO assessment process in the future). For each discharger assigned a WLA, the appropriate State Water Board or Los Angeles Regional ~~Water~~ Board Order shall be reopened or amended when the order is reissued, in accordance with applicable laws, to incorporate the applicable WLA(s) as numeric water quality based effluent limitations~~a permit requirement consistent with federal regulation and related guidance (40 CFR 144.22(d)(1)(vii)(B); US EPA Memorandum "Revisions to the November 22, 2002 Memorandum 'Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs'" (November 12, 2010))~~. LAs will be implemented in a manner consistent with federal and state laws, regulations and policies, including the Nonpoint Source Implementation and Enforcement Policy.

Implementation by assigned responsible parties is required in three waterbody areas:

1. Dominguez Channel, Torrance Lateral, and Dominguez Channel Estuary
2. Greater Los Angeles and Long Beach Harbor waters (including Consolidated Slip)
3. Los Angeles River and San Gabriel River

Actions to achieve WLA and LA may be implemented in phases with information from each phase being used to inform the implementation of the next phase~~. These sediment targets are not intended to be used as 'clean-up standards' for navigational, capital or maintenance dredging or capping activities; rather they are long-term sediment concentrations that should be attained after reduction of external loads, targeted actions addressing internal reservoirs of contaminants, and environmental decay of contaminants in sediment.~~ The implementation may be adjusted, as necessary, based on information gained during each phase. Table 7-40.2 contains the schedule for responsible parties to develop and implement TMDL implementation plans and sediment management plans to comply with the TMDL.

~~10~~11.1 Dominguez Channel, Torrance Lateral, and Dominguez Channel Estuary

Responsible parties can implement a variety of implementation strategies to meet the required WLAs and LAs, such as non-structural and structural BMPs, diversion and treatment to reduce sediment transport from the watershed to Dominguez Channel and Greater Harbor waters, and sediment removal activities.

Nonpoint source elements include legacy sediments and air deposition across Dominguez Channel and Harbor waters. The responsible parties identified in the Allocation section and in part 6. *Application of Allocations to Responsible Parties* of this section are assigned sediment load allocations and responsibility for remediation of the contaminated sediments to attain the load allocations.

Phase I

The purpose of the Phase I implementation is to reduce the amount of sediment transport from point sources that directly or indirectly discharge to Dominguez Channel and the Harbor waters. Phase I should include watershed-wide implementation actions. Important components of Phase I should be to secure the relationships and agreements between cooperating parties and to develop a detailed scope of work with priorities.

Potential watershed-wide non-structural BMPs include more frequent and appropriately timed storm drain catch basin cleaning, improved street cleaning by upgrading to vacuum type sweepers, and educating residents and industries about good housekeeping practices. For PCBs specifically, source control is recommended to eliminate or control current sources of PCBs, including control and/or removal and disposal of PCBs-containing equipment and building material and PCB-contaminated soils. Structural BMPs may include the placement of stormwater treatment devices designed to reduce sediment loading, such as infiltration trenches, vegetated swales, and/or filter strips at critical points in the watershed. Structural BMPs may also include diversion and treatment facilities to divert runoff directly, or provide capture and storage of runoff and then diversion to a location for treatment. Treatment options to reduce sediment could include sand or media filters.

The Los Angeles County Flood Control District (District) owns and operates Dominguez Channel; therefore, the District and the cities that discharge to Dominguez Channel shall each be responsible for conducting implementation actions to address contaminated sediments in Dominguez Channel. Responsible parties in Dominguez Channel shall develop a Sediment Management Plan to address contaminated sediment in Dominguez Channel and Dominguez Channel Estuary.

Sediment conditions shall be evaluated through the ~~Sediment Quality Objective (~~SQO~~)~~ process detailed in the ~~SQO Part 1~~SQP. If chemicals within sediments are

contributing to an impaired benthic community or toxicity, then causative agent(s) shall be determined using SQO recommended procedures in the SQP~~, SQO Part 1 Section IV.A.4 (VII.F.)~~. Impacted sediments shall be included in the list of sites to be managed.

Phase II

Phase II should include the implementation of additional BMPs and site remedial actions, as determined to be effective based on the success of upstream source control, evaluation of TMDL monitoring data collected during Phase I, and targeted source reduction activities as identified in Phase I. Regional responsible parties should develop, prioritize, and implement Phase II elements based on data from the TMDL monitoring program and other available information from special studies. Possible actions include implementation of additional structural and non-structural BMPs throughout the watershed by municipalities, LA County, Caltrans, and others. Phase II should include the implementation of site-specific cleanup actions for areas identified as high priority in the Dominguez Channel Estuary and in accordance with the Sediment Management Plan.

- As management actions are planned for a contaminated site, site-specific cleanup criteria should be determined following protocols that are consistent with state and national laws and regulations and guidance. The site improvements should be confirmed through a sediment monitoring program.

- There are two Superfund sites located within Dominguez Channel Watershed: the Montrose Superfund Site and the Del Amo Superfund Site. The US EPA has not yet reached a final remedial decision with respect to certain of the Montrose Superfund Site Operable Units (OUs) that remain contaminated with DDT, including the on- and near-property soils (OU1), the current storm water pathway (OU2), and the "Neighborhood Areas" (OU4 and OU6). The TMDL, its waste load and load allocations, and other regulatory provisions of this TMDL may be applicable or relevant and appropriate requirements (ARARs) as set forth in Section 121(d) of the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. §§ 9621(d)) for those OUs. Whether provisions within the TMDL are ARARs will be determined in accordance with CERCLA when US EPA develops Records of Decision for the Superfund sites. The TMDL for DDT should be taken into account in the course of the remedial decision-making process. The City of Los Angeles and/or Los Angeles County, should they decide to take action that impacts one of the OUs, shall consult with US EPA's Superfund Division in advance of such action. Detection of DDT compounds in water or sediment samples collected within Torrance Lateral shall trigger additional monitoring, by parties to be determined by the Executive Officer, in coordination with US EPA, to evaluate potential contribution from contaminated soils related to upstream Montrose operable units discharging via

the Kenwood storm drain. Upon reconsideration of the TMDL, all monitoring results for DDT compounds collected by responsible parties or other entities shall be considered as part of source analysis and to determine potential future allocation(s) that may be necessary to minimize impacts to downstream waters and restore beneficial uses in TMDL waterbodies.

Phase III

Phase III should include implementation of secondary and additional remediation actions as necessary to be in compliance with final allocations by the end of the implementation period. TMDLs to allocate additional contaminant loads between dischargers in the Dominguez Channel, Torrance Lateral and Dominguez Channel Estuary subwatersheds may also be developed, if necessary.

~~10~~11.2 Greater Los Angeles and Long Beach Harbor Waters (including Consolidated Slip)

Responsible parties can implement a variety of implementation strategies to meet the required WLAs, such as non-structural and structural BMPs, and/or diversion and treatment to reduce sediment transport from the nearshore watershed to the Greater Harbor waters.

Phase I

The purpose of Phase I implementation is to reduce the amount of sediment transport from point sources that directly or indirectly discharge to the Harbor waters. Phase I should include actions to be implemented throughout the nearshore watershed and specific implementation actions at the Ports. Important components of Phase I should be to secure the relationships and agreements between cooperating parties and to develop a detailed scope of work with priorities.

Potential watershed-wide non-structural BMPs include more frequent and appropriately timed storm drain catch basin cleaning, improved street cleaning by upgrading to vacuum type sweepers, and educating residents and industries about good housekeeping practices. For PCBs specifically, source control is recommended to eliminate or control current sources of PCBs, including control and/or removal and disposal of PCBs-containing equipment and building material and PCB-contaminated soils. Structural BMPs may include the placement of stormwater treatment devices designed to reduce sediment loading, such as infiltration trenches, vegetated swales, and/or filter strips at critical points in the watershed. Structural BMPs may also include diversion and treatment facilities to divert runoff directly, or provide capture and storage of runoff and then diversion to a location for treatment. Treatment options to reduce sediment could include sand or media filters.

Implementation actions at the Ports should be developed to address different sources that contribute loading to the Harbors such as Port-wide activities and associated control measures for water and sediment, control measures to reduce the discharges from various land uses in the Harbors, nearshore discharges, and on-water discharges. The implementation actions described in the Water Resources Action Plan (WRAP) adopted by the Port of Los Angeles and the Port of Long Beach represent a range of activities that could be conducted to control discharges of polluted stormwater and contaminated sediments to the Harbors.

To meet necessary reductions in sediment bed loads, a Sediment Management Plan shall be developed by the dischargers assigned a sediment bed load LA, the Cities of Los Angeles and Long Beach and the State Lands Commission. Phase I implementation elements for the improvement of the Harbors' sediment quality should be conducted through the continuation of source reduction, source control, and sediment management. Below are proposed implementations actions that may be implemented in Phase I to improve sediment quality at the ports:

- Removal of Contaminated Sediment within Areas of Known Concern. Planned removal programs are in place for IR Site 7 (former Navy facility in the Port of Long Beach) and Berth 240 (former Southwest Marine facility in the Port of Los Angeles). Contaminated sediment will be removed by Port of Long Beach and Port of Los Angeles.

- Sediment Management Plan, Prioritization Assessment for Contaminated Sediment Management. Sediment will be evaluated through the ~~Sediment Quality Objective (~~SQO~~)~~ process detailed in the ~~Enclosed Bays and Estuaries Plan (i.e., SQO Part 1 as amended)~~SQP. If chemicals within sediments are contributing to an impaired benthic community or toxicity, or impaired fish tissue, then causative agent(s) will be determined using SQO ~~recommended~~ procedures provided in the~~, including SQO Part I~~SQP (IV.A~~VII. F.~~). Impacted sediments will be included in the list of sites to be managed. The sites to be managed by the responsible parties will be prioritized for management and coupled with other planned projects when feasible. Prioritized sites shall include known hot spots, including but not limited to Consolidated Slip and Fish Harbor. For these prioritized sites, the sediment management plan shall include concrete actions and milestones, including numeric estimates of load reductions or removal, to remediate these priority areas and shall demonstrate that actions to address prioritized hot spots will be initiated and completed as early as possible during the 20-year TMDL implementation period. This process will prioritize management efforts on sites that have the greatest impact to the overall health of the benthic community and fish tissue, and allow sites with lower risks to be addressed in later phases when opportunities can be coupled to capital projects. As management actions are planned for a contaminated site, site-specific cleanup criteria will be determined following established

protocols that are consistent with state and national policy and guidance. The site will then be managed and the improvements confirmed through a sediment monitoring program.

- Superfund Sites. Two Superfund sites are located in Dominguez Channel Watershed: the Montrose Superfund Site (DDT) and the Del Amo Superfund Site (benzene). The Montrose Superfund Site includes multiple operable units (OUs), which are identified as investigation areas potentially containing site-related contamination. These Superfund Sites are located in a community known as Harbor Gateway, which is situated mostly in the City of Los Angeles and partially in unincorporated land in Los Angeles County. Harbor Gateway lies within the Kenwood Drain subwatershed, which discharges stormwater into Torrance Lateral which flows downstream into saline waters of Dominguez Channel Estuary and Consolidated Slip. The Torrance Lateral, Dominguez Channel Estuary and Consolidated Slip (OU2) contain sediments contaminated with multiple pollutants including DDT (potentially from various sources). The US Environmental Protection Agency (US EPA) has been working with other government agencies and local agencies including the City of Los Angeles and Los Angeles County to ensure the protection of both the environment and public health in the areas surrounding these Superfund sites. In August 1999, USEPA and the State of California, which includes the Los Angeles Regional ~~Water~~ Board, entered into a consent decree concerning the Montrose Superfund site in a case entitled United States of America and State of California versus Montrose Chemical Corporation of California, et al., United States District Court Central District of California, Case No. CV 90-3122-AAH (JRx). The US EPA has not yet reached a final remedial decision with respect to certain of the Montrose Superfund Site Operable Units (OUs) that remain contaminated with DDT, including the on- and near-property soils (OU1), the current storm water pathway (OU2), and the "Neighborhood Areas" (OU4 and OU6). The TMDL, its waste load and load allocations, and other regulatory provisions of this TMDL may be applicable or relevant and appropriate requirements (ARARs) as set forth in Section 121(d) of the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. §§ 9621(d)) for those OUs. Whether provisions within the TMDL are ARARs will be determined in accordance with CERCLA when USEPA develops Records of Decision for the Superfund sites. The TMDL for DDT should be taken into account in the course of the remedial decision-making process. US EPA Superfund does not need to make a remedial decision prior to individual or collective action (by City of LA and/or County of LA) to clean up sediments within the OU2 pathway. The City of Los Angeles and/or Los Angeles County, should they decide to take action that impacts one of the OUs, shall consult with US EPA's Superfund Division in advance of such action. The goal of consultation is to ensure the proposed sediment cleanup will not aggravate the situation or further interfere with the

OU2 site. Detection of DDT compounds in water or sediment samples collected within Torrance Lateral shall trigger additional monitoring, by parties to be determined by the Executive Officer, in coordination with EPA, to evaluate potential contribution from contaminated soils related to upstream Montrose operable units discharging via the Kenwood storm drain. Upon reconsideration of the TMDL, all monitoring results for DDT compounds collected by responsible parties or other entities shall be considered as part of source analysis and to determine potential future allocation(s) that may be necessary to minimize impacts to downstream waters and restore beneficial uses in TMDL waterbodies.

Phase II

Phase II should include the implementation of additional BMPs and site remedial actions in the nearshore watershed and in the Harbors, as determined to be effective based on the success of upstream source control, TMDL monitoring data evaluations, WRAP activities implemented during Phase I, and targeted source reduction activities as identified in Phase I. Responsible parties should develop, prioritize, and implement Phase II elements based on data from the TMDL monitoring program and other available information from special studies. Possible actions include additional structural and non-structural BMPs throughout the watershed.

Phase II should include the implementation of site-specific cleanup actions for areas identified as high priority in the Harbor waters and per the Sediment Management Plan.

Phase III

The purpose of Phase III is to implement secondary and additional remediation actions as necessary to be in compliance with final waste load and load allocations by the end of the TMDL implementation period.

~~4011~~11~~10~~.3 Los Angeles River and San Gabriel River

Responsible parties in these watersheds are implementing other TMDLs, which will directly or indirectly support the goals of this TMDL.

Phase I

Responsible parties for each watershed shall submit a Report of Implementation to describe how current activities support the downstream TMDL.

Phases II and III

Implementation actions may be developed and required in Phases II and III as necessary to meet the targets in the Greater Harbor waters. TMDLs to allocate

contaminant loads between dischargers in the Los Angeles and San Gabriel Rivers watersheds may also be developed, if necessary

~~10~~11.4 Special Studies and Reconsideration of TMDL Targets, Allocations, and Schedule

This TMDL recognizes that as work to understand these waters and the chemical, physical and biological processes, continues, the targets, allocations, and the flow threshold for wet-weather conditions and the implementation actions to reach those targets and allocations may need to be adjusted. Furthermore, if impairments are identified during flow conditions less than the 90th percentile flow in Dominguez Channel and/or Torrance Lateral, additional allocations for those flow conditions will be developed and applied at the TMDL reconsideration. In addition, it may be necessary to make adjustments to the TMDL to be responsive to new State policies including, but not limited to, SQO Part II; toxicity policy; possible changes to air quality criteria and other regulations affecting air quality.

Optional special studies, which could result in changes to these TMDLs, include but are not limited to: studies to further refine the site specific link between sediment pollutant concentrations, depth of bed sediment contamination and fish tissue concentrations; foraging ranges of targeted fish; additional data to refine watershed and hydrodynamic models, including that collected pursuant to this TMDL; additional data on contaminant contributions of the Los Angeles River or San Gabriel River to Greater Harbor waters; stressor identifications; and additional diazinon data. Completion of studies to further refine the site specific link between sediment pollutant concentrations and fish tissue pollutant concentrations and evaluate the range and habitat of specific fish populations will be used to evaluate changes in TMDL targets, WLAs and LAs, and to guide future implementation actions. In addition, further characterization of direct air deposition loadings for heavy metals and legacy pesticides is an optional special study. Allocations of certain pollutants in certain waterbodies are confounded by the existing estimates of pollutant loading via direct air deposition onto the waterbodies. Additional monitoring of these pollutants at air sampling sites more closely resembling the respective waterbodies will help characterize these loadings. Limited data exist for dry deposition so this study could be extended over longer timeframes. Measurements of wet deposition for each pollutant may also be appropriate to estimate air deposition more completely. Study results could provide data to reconsider pollutant-specific allocations in this TMDL.

Detection of DDT compounds in water or sediment samples collected within Torrance Lateral shall trigger additional monitoring, by parties to be determined by the Executive Officer, in coordination with EPA, to evaluate potential contribution from contaminated soils related to upstream Montrose operable units discharging via the Kenwood storm drain. Upon reconsideration of the TMDL, all monitoring results for DDT compounds collected by responsible parties or other entities shall be considered as part of source

analysis and to determine potential future allocation(s) that may be necessary to minimize impacts to downstream waters and restore beneficial uses in TMDL waterbodies.

As allocation-specific data are collected, interim targets for the end of Phase II may be identified.

The TMDL will be was reconsidered by the Los Angeles Regional Water Board at the end of Phase I to consider completed special studies or and policy changes.

1011.5 Compliance with Allocations and Attainment of Numeric Targets

Compliance with the TMDL shall be determined through water, sediment, and fish tissue monitoring and comparison with the TMDL waste load and load allocations and numeric targets. Compliance with the sediment TMDL for metals, and PAH compounds, and bioaccumulative compounds shall be based on achieving the loads and waste load allocations or, alternatively, demonstrating attainment of the SQO Part 1SQP through the sediment triad/multiple lines of evidence approach outlined therein. Compliance with the TMDLs for bioaccumulative compounds shall be based on achieving the assigned loads and waste load allocations or, alternatively, by meeting fish tissue targets. If at any point during the implementation plan, monitoring data or special studies indicate that load and waste load allocations will be attained, but fish tissue targets may not be achieved, the Los Angeles Regional Water Board shall reconsider the TMDL to modify the waste load and load allocations to ensure that the fish tissue targets are attained.

The compliance point for the stormwater WLAs shall be at the storm drain outfall of the permittee's drainage area. Alternatively, if stormwater dischargers select a coordinated compliance monitoring option, the compliance point for the stormwater WLA may be at storm drain outfalls or at a point in the receiving water, which suitably represents the combined discharge of cooperating parties discharging to Dominguez Channel and Greater Los Angeles and Long Beach Harbor waters. Depending on potential BMPs implemented, alternative stormwater compliance points may be proposed by responsible parties subject to approval by the Los Angeles Water Regional Board Executive Officer. The compliance point(s) for responsible parties receiving load allocations shall be in the receiving waters or the bed sediments of the Dominguez Channel and the Greater Los Angeles and Long Beach waters.

1011.6 Application of Allocations to Responsible Parties

Responsible parties for monitoring and to attain LAs and WLAs for this TMDL include but are not limited to:

~~10~~11.6.1 Dominguez Channel Responsible Parties

- Dominguez Channel, Torrance Lateral, and Dominguez Channel Estuary MS4 Permittees
    - Los Angeles County
    - Los Angeles County Flood Control District
    - Caltrans
    - City of Carson
    - City of Compton
    - City of El Segundo
    - City of Gardena
    - City of Hawthorne
    - City of Inglewood
    - City of Lawndale
    - City of Long Beach
    - City of Los Angeles
    - City of Manhattan Beach
    - City of Redondo Beach
    - City of Torrance
- Individual and General Stormwater Permit Enrollees
- Other Non-stormwater Permittees
- Dominguez Channel Estuary Subgroup for bed sediment and fish:
    - Los Angeles County
    - Los Angeles County Flood Control District
    - Caltrans
    - City of Carson
    - City of Compton
    - City of Gardena
    - City of Los Angeles

- City of Long Beach
- City of Torrance

~~10~~11.6.2 Greater Los Angeles and Long Beach Harbor Waters Responsible Parties

- Greater Los Angeles and Long Beach Harbor Waters MS4 Permittees
  - Los Angeles County
  - Los Angeles County Flood Control District
  - Caltrans
  - City of Bellflower
  - City of Lakewood
  - City of Long Beach
  - City of Los Angeles
  - City of Paramount
  - City of Signal Hill
  - City of Rolling Hills
  - City of Rolling Hills Estates
  - Rancho Palos Verdes
- City of Los Angeles (including the Port of Los Angeles)
- City of Long Beach (including the Port of Long Beach)
- State Lands Commission
- Individual and General Stormwater Permit Enrollees
- Other Non-stormwater Permittees, including City of Los Angeles (TIWRP)
- Los Angeles River Estuary Subgroup for bed sediment and fish:
  - Los Angeles County
  - Los Angeles County Flood Control District
  - City of Long Beach
  - City of Los Angeles
  - City of Signal Hill

- Caltrans

- Consolidated Slip Responsible Parties subgroup[4]
  - Consolidated Slip MS4 Permittees
    - Los Angeles County
    - Los Angeles County Flood Control District
    - City of Los Angeles

~~10~~11.6.3 Los Angeles River and San Gabriel River Watershed TMDLs Responsible Parties

Los Angeles River and San Gabriel River metals TMDLs responsible parties (For list of responsible parties, see Chapter 7-13 herein and US EPA, "Total Maximum Daily Loads for Metals and Selenium: San Gabriel River and Impaired Tributaries", March 26, 2007.)

[4] US EPA is the regulatory oversight agency pursuant to CERCLA with respect to the two Superfund sites within the Consolidated Slip subarea but is not identified as a Responsible Party under the TMDL. As the regulatory oversight agency, US EPA is responsible for choosing an appropriate remedy for these sites. Furthermore, under CERCLA, US EPA is responsible for assuring that the CERCLA PRPs clean up the site in compliance with CERCLA and applicable or relevant and appropriate requirements (ARARs) (CERCLA section 121(d)).

7-40.2 Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters Toxic Pollutants TMDL: Implementation Schedule

Task Number	Task	Responsible Party	Deadline
1	Interim allocations are achieved.	All Responsible Parties	~~Effective date of the TMDL~~March 23, 2012
2	Submit a Monitoring Plan to the Los Angeles Regional Board for Executive Officer approval.	Dominguez Channel Responsible Parties; Greater Harbors Responsible Parties; Consolidated Slip Responsible Parties subgroup; Los Angeles and San Gabriel River Responsible Parties	~~20 months after effective date of the TMDL~~November 23, 2013
3a	Implement Monitoring Plan	Dominguez Channel Responsible Parties; Greater Harbors Responsible Parties; Consolidated Slip Responsible Parties subgroup; Los Angeles and San Gabriel River Responsible Parties	6 months after monitoring plan approved by Executive Officer.
3b	Re-run the linked model for the Greater Harbor Waters	Greater Harbors Responsible Parties	Every 5 years in coordination with the approved monitoring plan for Greater Harbor Waters
4	Submit annual monitoring reports to the Los Angeles Regional Board.	All Responsible Parties	15 months after monitoring starts and annually thereafter
5a	Submit an Implementation Plan and Contaminated Sediment Management Plan (CSMP). The Implementation Plan and CSMP shall be circulated for public review for 30 days. The CSMP shall include concrete milestones with numeric estimates of load reductions or removal, including milestones for remediating hot spots, including but not limited to Dominguez Channel Estuary, Consolidated Slip and Fish Harbor, for Executive Officer approval. The Executive Officer shall consider the Consent Decree for the Montrose Superfund site in determining whether to approve the CSMPs.	Dominguez Channel Responsible Parties; Greater Harbors Responsible Parties; Consolidated Slip Responsible Parties subgroup	~~2 years after effective date of the TMDL~~March 23, 2014
5b	Submit a revised CSMP to include milestones with specific plans and associated completion dates for remediating identified hot spots (including but not limited to Dominguez Channel Estuary, Consolidated Slip, and Fish Harbor). A Cleanup and abatement order ~~shall be required~~ may be issued if responsible parties for identified hot spots submit an insufficient CSMP for remediating of the hot spots	Dominguez Channel Responsible ~~p~~Parties; Greater Harbors Responsible Parties; Consolidated Slip Responsible Parties subgroup	30 days after the effective date of the revised TMDL ~~January 31, 2023~~ for identified hot spots, and 16 months after hot spot(s) are identified and confirmed in the future

6	Submit Report of Implementation to the Los Angeles Regional Board.	Los Angeles and San Gabriel River Responsible Parties	~~2 years after effective date of the TMDL~~March 23, 2014
7	Submit annual implementation reports to the Los Angeles Regional Board. Report on implementation progress and demonstrate progress toward meeting the assigned LAs and WLAs.	All Responsible Parties	~~3 years after effective date of the TMDL~~March 23, 2015 and annually thereafter
8	Complete Phase I of TMDL Implementation Plan and ~~Sediment Management Plan~~CSMP.	Dominguez Channel Responsible Parties; Greater Harbors Responsible Parties; Consolidated Slip Responsible Parties subgroup	~~5 years after effective date of the TMDL~~March 23, 2017
9	Submit updated Implementation Plan and ~~Contaminated Sediment Management Plan~~CSMP.	Dominguez Channel Responsible P~~p~~arties; Greater Harbors Responsible Parties; Consolidated Slip Responsible Parties subgroup	~~5 years after effective date of the TMDL~~March 23, 2017
10	The Los Angeles Regional ~~Water~~ Board will reconsider targets, WLAs, and LAs based on new policies, data or special studies. The Los Angeles Regional ~~Water~~ Board will consider requirements for additional implementation or TMDLs for Los Angeles and San Gabriel Rivers and interim targets and allocations for the end of Phase II.	~~Regional~~ Los Angeles Regional ~~Water~~ Board	~~6 years after the effective date of the TMDL~~March 23, 2018
11	Report on status of implementation and scope and schedule of remaining Phase II implementation actions to Los Angeles Regional ~~Water~~ Board.	All Responsible P~~p~~arties	~~10 years after the effective date of the TMDL~~March 23, 2022
12	Complete Phase II of TMDL Implementation Plan and ~~Sediment Management Plan~~CSMP.	Dominguez Channel Responsible P~~p~~arties; Greater Harbors Responsible Parties; Consolidated Slip Responsible Parties subgroup	~~15 years after effective date of the TMDL~~March 23, 2027
13	Complete Phase III of TMDL Implementation Plan and ~~Sediment Management Plan~~CSMP.	Dominguez Channel Responsible Parties; Greater Harbors Responsible Parties; Consolidated Slip Responsible Parties subgroup	~~20 years after effective date of the TMDL~~March 23, 2032
14a	Attain water column LAs and WLAs identified in Section 7.2.1 and Tables 11-15 ~~allocations~~	All Responsible Parties	March 23, 2032
14b	~~Demonstrate attainment of~~ Attain sediment LAs and WLAs ~~using the means identified under Waste Load and Load Allocations in Table 7-40.1~~for Benthic Community Protection identified in Tables 16 and 17.	All Responsible Parties	~~20 years after effective date of the TMDL~~March 23, 2032
15	Attain sediment LAs and WLAs for Human Health Protection identified in Table 18.	All Responsible parties	March 23, 2040