Dominguez Channel and Los Angeles and Long Beach Harbors TMDLs
PROJECT PLAN

Waterbody: Dominguez Channel and Los Angeles and Long Beach Harbors
Watershed Location: South Los Angeles County
Pollutants: Metals and Toxics

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Web page: http://www.waterboards.ca.gov/losangeles/html/meetings/tmdl/tmdl_ws_dominguez.html

Anticipated Completion Dates:

Milestone/Product	**Completion Year**
Completion of required hydrodynamic and water quality models	Winter 2007
Presentation of allocation scenarios to stakeholders	Spring 2007
Adoption of Basin Plan Amendment by Regional Board	July 2008*
State Water Resources Control Board Approval	November 2008
Office of Administration Law Approval	January 2009
USEPA Approval	March 2009

*Note: an accelerated date of RB adoption may be pursued if analytical tools are completed early.

Introduction

The watershed of the Dominguez Channel and the Los Angeles and Long Beach Harbors is an enormously important industrial, commercial and residential area with unique and important historical and environmental resources. The area includes 18 municipalities within and including Los Angeles County and roughly 1 million residents. Prior to its development, the area was largely marshland and now almost no wetland or original coastline exists. Water quality decreased with development reaching a nadir in the 1970s. Since then, the water quality has improved but there are still significant water quality and sediment quality challenges.

The Dominguez Channel watershed is approximately 345 square miles, and is principally urban with 62% impervious surfaces. The Harbors also receive the discharges of the Los Angeles and San Gabriel Rivers, although these watersheds are not a focus of this TMDL. The Los Angeles River is largely wastewater flow and the watershed is 834 square miles, 66% developed. The San Gabriel River is 689 square miles (including The Los Cerritos Channel and Alamitos Bay) and is largely developed in the downstream end.

The ports of Los Angeles and Long Beach occupy over 10,500 acres of land and water. The Inner Harbors contains piers for ship loading and unloading and several marinas. The outer part of both harbors (the greater San Pedro Bay) has been less disrupted than the inner areas and supports a great diversity of marine life. It is open to the ocean at its eastern end and receives much greater ocean flushing than inner harbor areas.

This project plan addresses water quality in Dominguez Channel and waters associated with greater Los Angeles and Long Beach Harbor (greater Harbor waters). Specifically, the greater Harbor waters include Inner and Outer Harbor, Fish Harbor, Cabrillo Marina, Cabrillo Beach—Inner, Los Angeles River Estuary, and San Pedro Bay. It also includes freshwaters of Dominguez Channel and Torrance Lateral as well as Dominguez Channel estuary. The TMDL will address loading from the San Gabriel River Estuary, however, TMDLs will not be developed for the San Gabriel River Estuary. The San Gabriel River Estuary is addressed in the San Gabriel River Metals and Selenium TMDL, which was released for public comment on May 5, 2006.

This project plan lays out a sketch of the basic approaches, which are intended to be used at this time. These approaches can be altered as more data is collected, information is processed and stakeholders bring valuable perspectives to improve the TMDL. Significant changes may be made before the TMDL is finalized.

Discharges to the Watershed

There are many permitted discharges to the watershed. There are approximately 60 active, individual NPDES permitted discharges to the Dominguez Channel and to the Los Angeles and Long Beach Harbors. These include four refineries which discharge stormwater to the Dominguez Channel intermittently, two generating stations which discharge to the inner harbor areas and the Terminal Island Treatment Plant. The Terminal Island Treatment Plant is the single POTW which discharges to the watershed. This secondary-treated effluent is discharged to the outer Los Angeles and Long Beach Harbor and is under a time schedule order to eliminate the discharge.

In addition, there are approximately 50 active, general NPDES permitted discharges to the watershed.

Stakeholder Participation

Stakeholders are numerous and varied, and include industry, residents, and municipalities. Stakeholder participation and contributions are essential to development of appropriate and fair TMDLs and to innovative and effective implementation.

Stakeholders in the Dominguez Channel and Los Angeles and Long Beach Harbors include:

- Regulatory Agencies
  - Regional Board
  - USEPA
  - Army Corps of Engineers (ACOE)
  - Coastal Conservancy
  - California Fish and Game
- Large Municipalities
  - City of Los Angeles
    - Regulatory Affairs
    - DPW
    - Rec. and Parks
    - Bureau of Sanitation
  - County of Los Angeles
  - Port of Los Angeles (part of City of Los Angeles)
  - Port of Long Beach (part of City of Long Beach)
- Smaller municipalities

Carson	Long Beach
Compton	Manhattan Beach
Gardena	Palos Verdes Estates
El Segundo	Rancho Palos Verdes
Hawthorne	Redondo Beach
Inglewood	Rolling Hills
Lawndale	Rolling Hill Estates

Lomita	Torrance

Environmental groups
- Heal the Bay
- South Bay Audubon
- Los Angeles and San Gabriel Rivers Council

Resident groups
- Neighborhood Councils (within the City of Los Angeles)
- PCAC (Port of LA's resident group)
- Fishermen or swimmers groups (Polar Bears etc)

Dischargers/industry
- Refineries
- Western States Petroleum Association (WSPA)
- Water Management Districts
- County Sanitation District

University/Research
- Southern California Coastal Water Research Project (SCCWRP)
- University of California Lawrence Berkeley National Lab (UC LBNL)
- University of California, Los Angeles (UCLA)
- Department of Energy Lawrence Livermore National Labs (LLNL)

For stakeholder outreach, the Regional Board and USEPA staff will hold public meetings and participate in watershed groups, in particular the Dominguez Watershed Advisory Council (DWAC). The principal forums for participation in TMDL development for the stakeholders will be two stakeholder groups, an Advisory Council and a Technical Advisory Committee (TAC).

1) Advisory Council: The Advisory Council will track progress, recommend further outreach, meetings or training, suggest studies relevant to TMDL development, offer resources to address monitoring gaps if appropriate, provide commentary on TMDL products and advise the process. Specific issues that the Advisory Council may address include how to ensure the TMDL process is inclusive and transparent, coordination with other water quality efforts in the watershed, and implementation.

2) Technical Advisory Committee (TAC): The TAC will provide data and technical expertise on water quality, hydrodynamics and sediment, local watershed knowledge, and important perspectives on TMDL targets and goals, thus enabling the development of a robust TMDL model. The TAC will be the principal avenue for stakeholder technical expertise brought to bear on the TMDL process and the TAC will work from the perspective of the model as it is structured and model scenarios are developed. TAC members may review documents, contribute and analyze data, and participate in discussions about structuring the model.

Regulatory Background

The State of California's principal water quality law is the Porter-Cologne Water Quality Act (Porter Cologne). Porter Cologne is implemented in the Los Angeles Region by the California Water Quality Control Plan, Los Angeles Region (Basin Plan). The Basin Plan sets water quality standards for the Los Angeles Region, which include beneficial uses for surface and ground water with the numeric and narrative objectives necessary to support those uses, and the state's antidegradation policy. The Basin Plan also describes implementation programs to protect all waters in the region. The Basin Plan, along with the Water Quality Control Plan for Ocean Waters of California (Ocean Plan), serves as the State Water Quality Control Plan for the Dominguez Channel and Los Angeles and Long Beach Harbors.

These plans are required by and in compliance with the federal Clean Water Act (CWA).
Section 303(d)(1)(A) of the CWA requires each state to conduct a biennial assessment of its waters, and identify those waters that are not achieving water quality standards (Los Angeles Regional Water Quality Control Board, 2003a). The resulting list is referred to as the 303(d) list. The CWA also requires states to establish a priority ranking for waters on the 303(d) list of impaired waters and to develop and implement Total Maximum Daily Loads (TMDL) for these waters.

A TMDL specifies the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and allocates the pollutant loadings to point and nonpoint sources. The elements of a TMDL are described in 40 CFR 130.2 and 130.7 and Section 303(d) of the CWA, as well as in U.S. Environmental Protection Agency guidance (U.S. EPA, 1991). A TMDL is defined as the "sum of the individual waste load allocations for point sources and load allocations for nonpoint sources and natural background" (40 CFR 130.2) such that the capacity of the waterbody to assimilate pollutant loads (the loading capacity) is not exceeded. TMDLs must take into account seasonal variations and include a margin of safety to address uncertainty in the analysis (40 CFR 130.7(c)(1)). Finally, states must develop water quality management plans to implement the TMDLs (40 CFR 130.6).

The U.S. EPA has oversight authority for the 303(d) program and is required to review and either approve or disapprove the state's 303(d) list and each TMDL developed by the state. If the state fails to develop a TMDL in a timely manner or if the U.S. EPA disapproves a TMDL submitted by a state, EPA is required to establish a TMDL for that waterbody (40 CFR 130.7(d)(2)).

As part of its 1996 and 1998 regional water quality assessments, the Regional Board identified over 700 waterbody-pollutant combinations in the Los Angeles Region where TMDLs would be required (LARWQCB, 1996, 1998). A 13-year schedule for development of TMDLs in the Los Angeles Region was established in a consent decree (Heal the Bay Inc., et al. v. Browner, et al. C-98-4825 SBA) (United States District Court, Northern District of California, 1999) approved on March 22, 1999.

In the Dominguez Channel and Los Angeles and Long Beach Harbors these waterbody pollutant combinations are combined and identified as Analytical Units 73, 74, 75, and 78. However, Machado lake will not be addressed in these TMDLs so parts of Analytical Unit 75 (Wilmington Drain for copper and lead) and Analytical Unit 73 (Machado Lake for Chlordane, DDT and PCBs) will not be addressed. The consent decree requires that USEPA either approve a state TMDL for these Analytical Units or establish its own, by 2011.

Table 1: 2002 303(d) list of individual pollutant impairments by waterbody.

Waterbody name	Tissue	Sediment
Dominguez Channel (freshwater, above Vermont)	Aldrin, Chem A, Chlordane, Dieldrin, DDT, PCBs, Lead	DDT, PAHs, Chromium, Zinc, Copper in water column
Torrance Carson Channel Lateral		Copper and Lead in water column
Dominguez Channel Estuary (to Vermont)	Aldrin, Chem A, Chlordane, Dieldrin, DDT, Lead	DDT, PAHs, Chromium, Zinc, Benthic Community Effects
Los Angeles Harbor Consolidated Slip	Chlordane, Dieldrin, DDT, PCBs, Toxaphene	Chlordane, DDT, PAHs, PCBs, Cadmium, Chromium, Copper, Mercury, Nickel, Lead, Zinc, Benthic Community Effects, Sediment Toxicity
Los Angeles Harbor Inner Breakwater	DDT, PAHs, PCBs	---
Los Angeles Harbor Main Channel	DDT, PAHs, PCBs, Copper, Zinc	DDT, PAHs, PCBs, Copper, Zinc, Sediment Toxicity
Los Angeles Harbor Southwest Slip	DDT, PCBs	Sediment Toxicity
Los Angeles Fish Harbor	DDT, PAHs, PCBs	---

Long Beach Harbor	DDT, PCBs	PAHs, Benthic Community Effects, Sediment Toxicity
Cabrillo Beach (Inner)	DDT, PCBs	---
Cabrillo Beach (Outer)	DDT, PCBs	---
San Pedro Bay	DDT, PCBs	DDT, PAHs, Chromium, Copper, Zinc, Sediment Toxicity
Los Angeles River Estuary	---	Chlordane, DDT, PCBs, Lead, Zinc

Beneficial Uses

The Basin Plan designates beneficial uses for water bodies in the Los Angeles Region. These uses are recognized as existing (E), potential (P), or intermittent (I) uses. All beneficial uses, whether E, P or I, must be protected. Beneficial use designations in the Dominguez Channel and the Harbors include Industrial Service Supply (IND), Navigation (NAV), Contact (REC-1) and Non-contact Recreation (REC-2), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species Habitat (RARE), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction and/or Early Development (SPWN), Shellfish Harvesting (SHELL) and associated wetlands (WET).

Waterbody name	Hydro Unit	Beneficial Uses
Dominguez Channel to Estuary (freshwater)	405.12	MUN(P), REC1(P), REC2(E), WARM(P), WILD(P), RARE(E)
Dominguez Channel Estuary	405.12	NAV(P), REC1(E), REC2(E), COMM(E), EST(E) MAR(E), WILD(E), RARE(E), MIGR(E) SPWN(E)
Los Angeles River Estuary	405.12	IND(E), NAV(E), REC1(E), REC2(E), COMM(E), EST(E) MAR(E), WILD(E), RARE(E), MIGR(E) SPWN(E), SHELL(P), WET(E)
Los Angeles-Long Beach Harbor Outer Harbor	405.12	NAV(E), REC1(E), REC2(E), COMM(E), MAR(E), RARE(E), SHELL(P)
Los Angeles-Long Beach Harbor Marinas	405.12	IND(E), NAV(E), REC1(E), REC2(E), COMM(E), MAR(E), RARE(E), SHELL(P)
Los Angeles-Long Beach Harbor Public Beach Areas	405.12	NAV(E), REC1(E), REC2(E), COMM(E), MAR(E), WILD(E), RARE(E), SPWN(P), SHELL(E)
Los Angeles-Long Beach Harbor All Other Inner Area	405.12	IND(E), NAV(E), REC1(P), REC2(E), COMM(E), MAR(E), RARE(E), SHELL(P)
Nearshore Zone (San Pedro Bay from shoreline to 30-foot depth contours)		IND(E), NAV(E), REC1(E), REC2(E), COMM(E), MAR(E), WILD(E), RARE(E), MIGR(E) SPWN(E), SHELL(P)
Offshore Zone (San Pedro Bay		IND(E), NAV(E), REC1(E), REC2(E), COMM(E), MAR(E), WILD(E), RARE(E), MIGR(E) SPWN(E), SHELL(P)

Problem Identification

This section will review water quality and sediment data on which the 2002 and draft 2006 303(d) impairment listings were based. Other, more recent, data and information will also be analyzed. In addition, data will be collected during development of the TMDLs.

The problem identification and source assessment will generally be consistent with the State's 303(d) listing policy and supporting Functional Equivalency Document (FED) and by and large staff will utilize the benchmarks required by the listing policy and supporting FED to determine exceedences; e.g., water column concentrations from the California Toxics Rule (CTR), sediment quality and fish tissue values from the listing policy. Exceptions, discussed below, may occur when the policy does not include a media-pollutant specific value or when staff determine that a more suitable or protective value was available for comparison.

This assessment will build on the data, which the SWRCB evaluated and compiled in the draft 2006 303(d) list. For the draft 2006 list, SWRCB staff reviewed available monitoring data, up to approximately 2001, to determine water quality conditions for each waterbody. For this TMDL assessment, EPA and Regional Board staff will also include more recent monitoring results. Important sources of new data will include: Bight 2003 study, Los Angeles County Department of Power and Water monitoring, City of Los Angeles Terminal Island Treatment Plant monitoring, Port of Los Angeles Dominguez Channel estuary model development, and Port of Long Beach water monitoring. To ensure the assessment is based on reliable data, staff will only include more recent results that have received QA/QC review.

Consistent with federal regulations, all available data and guidance for water quality assessment methodology will be used including both numeric and narrative water quality standards.

Summary of Sediment Quality Guidelines (SQG) to be used in assessments.

	Freshwater	**Saltwater**	**Other***
Metals	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**
Cadmium	4.98	4.21	
Chromium	111	370	
Copper	149	270	
Lead	128	112	
Mercury	1.06	2.1	
Silver	nr	1.77	
Zinc	459	410	
Organics	**(µg/kg)**	**(µg/kg)**	**(µg/kg)**
Chlordane	17.6	6	
Dieldrin	61.8	8	
Total DDTs	572	--	590*
Total PCBs	676	400	
Total PAHs	22,800	--	
2-methyl-napthalene	--	201	
Phenanthrene	1170	543	
Lo MW PAHs	--	1442	
Benza[a]anthracene	1050	692	
Benzo[a]pyrene	1450	763	
Chrysene	1290	845	
Dibenz[a,h]anthracene	--	260	

Pyrene	1520	1974	
Hi MW PAHs	--	9600	

Freshwater and saltwater SQG values from California listing policy, FED pg. 122-123
*Marine DDT value from EPA Superfund Risk Assessment (1994)

Numeric Targets

The TMDL will have multi-media numeric targets to include toxics and metals on the 303(d) list. Targets will be developed with consideration for human health, aquatic life and bioaccumulation. The California Toxics Rule (CTR) water quality standards for aquatic life protection will be used to develop targets for freshwater and saltwater metals, PAHs and organochlorines (chlordane, toxaphene, DDT and PCBs). Sediment targets will use Effects Range Low (ERL) values for metals, PAHs and chlordane. Sediment targets for DDT and PCBs will address bioaccumulation. In addition, fish tissue values will be developed for DDT and PCBs, based on CTR Human Health criteria.

	Metals, PAHs, chlordane				DDT, PCBs			
	water		sediment	tissue	water		sediment	tissue
	fresh	salt			fresh	salt		
Targets:	CTR (aquatic life)	CTR (aquatic life)	ERLs	CTR (human health)		CTR (human health)	bioaccum.	CTR (human health)

The Basin Plan narrative toxicity objective does not allow acute toxicity in any receiving waters or chronic toxicity outside designated mixing zones and states that limits for specific toxicants can be established to control toxicity identified under Toxicity Identification Evaluations (TIEs). The numeric targets for the constituents listed above are designed to address the water and sediment toxicity that has been identified in the watershed to date. However, toxicity of unknown causes may still occur in the future. To meet the narrative toxicity objective, a numeric toxicity target of one chronic toxicity unit (1 TUc) is established. A chronic toxicity target was selected because it addresses the potential adverse effects of long term exposure to lower concentrations of a pollutant and is therefore more protective than an acute toxicity target that may not address potential effects of longer term exposures. The following equation describes the calculation of a TUc.

TUc = Toxicity Unit Chronic = 100/NOEC (no observable effects concentration).

To protect the aquatic life beneficial use in the Dominguez Channel watershed and greater Harbor waters and to meet the Basin Plan narrative toxicity objective, the causes of toxicity observed in sediment in the watershed will be identified when possible. The Basin Plan narrative toxicity objective states that limits for specific toxicants can be established to control specific pollutants identified as causes of toxicity. The targets for the constituents listed above are assumed to address toxicity that has been identified in the watershed to date. However, toxicity of unknown causes may still occur in the future, and a numeric sediment toxicity target may be established to allow objective evaluation of the narrative toxicity objective.

The sediment toxicity target would be set at the no observable sediment toxicity level with sediment samples defined as toxic if the following two criteria are met: 1) there is a significant difference ($p<0.05$) in mean organism response (e.g., percent survival) between a sample and the control as determined using a separate-variance t-test, and 2) the mean organism response in the toxicity test (expressed as a percent of the laboratory control) was less than the 90th percentile Minimum Significant Difference (MSD) value. The 90th percentile MSD value is specific for each specific toxicity test protocol and is determined by identifying the magnitude of difference that can be detected 90% of the time. “In toxicity tests, the MSD represents the smallest difference between the control mean and a treatment mean (the effect size) that leads to the statistical rejection of the null hypothesis (H0: no difference). Any effect size equal to or larger than the MSD would result in a finding of statistically significant difference.

Source Assessment

TMDL development requires a calculation of pollutant loading from point and non-point sources within the watershed of concern. Point sources include discharges from discrete, engineered points. These types of discharges are regulated through the federal National Pollutant Discharge Elimination System (NPDES) program. Non-point sources include rainwater and runoff which carries pollutants that reach surface waters overland through a number of different land uses and activities. In the Dominguez Channel Watershed, however, much of the pollution carried in rainwater and runoff is conveyed via the network of storm drains throughout the watershed, and reaches the channel and Harbors as direct drain discharges. Storm water discharges from these drains are regulated under storm water NPDES permits. Due to their direct discharge to the channel and Harbors, urban and stormwater runoff, will be treated as point source discharges in these TMDLs.

An assessment of available data as discussed in the problem identification section and land-use, hydrologic and water quality models will be used to quantify sources of pollutants to the watershed. The Loading Simulation Program in C++ (LSPC) will be used for modeling freshwater bodies and freshwater nearshore inputs to greater Harbor waters. The Environmental Fluid Dynamics Code (EFDC) model will be used for hydrodynamics and water quality of the receiving waters.

Currently, three separate efforts contribute to the modeling of the Dominguez Channel and Los Angeles and Long Beach Harbors system.

1) The Port of Los Angeles, funded by a Proposition 13 grant, is developing the EFDC model for the Dominguez Channel Estuary including Consolidated Slip for both metals and organics. Everest International Consultants, Inc. is conducting the principal modeling and several additional subcontractors are contributing.

2) Southern California Coastal Water Research Project (SCCWRP) is completing an LSPC model for the freshwater reaches of the Dominguez Channel (wet weather only at this time) for both metals and organics. SCCWRP is also developing a hydrodynamic model of San Gabriel River estuary.

3) Tetra Tech Inc., under contract with USEPA, will revise the LSPC models developed for the freshwater inputs of the Los Angeles and San Gabriel Rivers and will complete the LSPC model for nearshore inputs. Tetra Tech will also develop the EFDC model to encompass all of the receiving waters. This EFDC model will integrate model information from all of the LSPC and EFDC projects mentioned above for metals and organics.

Additional water quality and sediment data will be collected to fill identified data gaps, and to calibrate and validate the model. At this time, two particular data needs have been prioritized by staff and discussed with the Advisory Council. The Regional Board currently has a $200,000 contract with SCCWRP which will be used, in part, to gather more data as identified immediately below.

1. Characterization of sediments, physical and chemical parameters, including data to estimate flux rates (sediment to water) of pollutants of concern is needed for these specific waterbodies and are critical to the water quality model. Partitioning data is especially important for organics, e.g. PCBs, PAHs (partitioning data for metals are better established and the land use model LSPC is more useful for metals).

2. Air deposition information, especially for organics directly to waterbody surface, is needed for source analysis and development of the model; existing information may be adequate for watershed characterization but there is little information on direct deposition to open waters.

Linkage Analysis and TMDL

The developed models will demonstrate how the sources of pollutants in the watershed are linked to the observed conditions in the impaired waterbodies. The analysis will also include an assessment of wet and dry conditions and critical conditions, which are periods when a body of water is most likely to exceed water quality standards. The linkage analysis will also be used to identify the assimilative capacity of the receiving water for the pollutant of concern by linking the source loading information to the water quality target. The TMDL is then divided among existing pollutant sources through the calculation of load and waste load allocations. The goals of the TMDL are to reduce pollutant loads from the watershed to the sediments and fish tissue.

The TMDL or loading capacity of pollutants per waterbody will be determined to attain water quality standards and restore beneficial uses. Loads will be expressed on daily timescale although longer averaging time periods may also be presented, where appropriate.

Information on sources of pollutants provides one part of the TMDL equation. To determine the effects of these sources on water quality, it is also necessary to determine the assimilative capacity of the receiving water. The delivery of pollutants to Dominguez Channel and greater Harbor waters and the assimilative capacity to accommodate these loadings can be strongly affected by variations between dry and wet weather. Given the differences in sources and flows between dry and wet weather, two distinct modeling approaches will be developed.

The impairing contaminants in sediment are associated with fine-grained particles that are delivered to the sediments through suspended solids in stormwater. It is expected that reductions in loadings of these pollutants will lead to reductions in sediment concentrations over time. The existing contaminants in surface sediments will be removed over time as sediments are scoured during storms or removed in dredging operations. For the legacy organochlorine pollutants, some loss may also occur through the slow decay and breakdown of these organic compounds. Concentrations in surface sediments will be reduced through mixing with cleaner sediments. Attenuation of pollutant concentration levels in sediment is expected to translate to reductions in fish tissue contaminant levels.

Critical Conditions

Critical conditions are the combination of environmental factors under which water quality criteria are most difficult to maintain. The critical conditions will be identified and are likely to be high rainfall events or based on a total suspended solids (TSS) load derived from long-term average rainfall. The amount of TSS in stormwater run-off is a function of the storms, which are highly variable between years. Use of the average condition for the TMDL may be appropriate because sediment effects on benthic communities and potential for bioaccumulation to higher trophic levels occur over long time periods.

Margin of Safety

TMDLs must include a margin of safety to account for any uncertainty concerning the relationships between sources, and water and sediment quality. An implicit margin of safety is applied through the use of ERLS, the more protective SQG values, as the numeric targets. An explicit margin of safety may be applied to address uncertainty within the TMDL and to ensure attainment of water quality standards.

Waste Load allocation and Load allocations

Point sources will be given *waste load* allocations (WLA) and non-point sources will be given *load* allocations (LA). The allocations may be expressed in mass- or concentration-based terms. Allocations will be designed such that the entire water body will meet the applicable numeric targets. For each waterbody, sufficient compliance points will be defined to correspond to watershed boundaries and to facilitate allocations to outside/upstream sources. Individual WLAs will be identified based on percentage land use designations, if correlations with specific pollutant types or groups are established. LAs will be subdivided, if available data can provide such refinement.

The models will be used to develop loading estimates, and in comparison with the allowable loads, will explore the required reductions. Receiving water models will examine temporal and spatial variations to explore several allocation scenarios. For example, given a specific pollutant(s), several waterbodies may be lumped together prior to identification of allocations. Stakeholder feedback on allocation scenarios will be especially important. Lawrence Livermore National Laboratory Stakeholder model and Cost Allocation model may meaningfully inform the process.

The TMDLs to address the fish tissue listings will be based on CTR Human Health criteria for Dominguez Channel and the greater Harbor waters. For dry weather the allowable loads may be based on the average dry-weather volume. For the wet-weather condition, the allowable loads may be expressed as a function of storm water volume using load-duration curves. A mass-based waste load allocation will be developed for the storm water permittees (MS4, Caltrans, general industrial and construction storm water permittees). Concentration-based WLAs will also be applied to the other non-storm water NPDES permittees.

The TMDLs to address sediment impairments will be based on pollutant loadings to the sediments of Dominguez Channel and the greater Harbor waters. The sediment loading capacity may be based on an estimate of the annual pollutant loads that can be delivered to the sediments and still meet the sediment targets. Load allocations will also be developed for direct atmospheric deposition. Concentration-based waste load allocations will apply to all other non-storm water NPDES permittees.

Contaminated In-situ Sediment

The waste load and load allocations will be developed to achieve the numeric targets in the Dominguez Channel and Harbors by the end of the compliance period. However, the Regional Board is aware that toxic pollutants are bound up in the sediments. To the extent that the Regional Board or another responsible jurisdiction or agency determines that in-situ toxic pollutants (in sediments) are still preventing the attainment of numeric targets, the Regional Board will issue appropriate investigatory orders or cleanup and abatement orders to achieve attainment of the numeric targets.

Implementation

The Porter-Cologne Water Quality Control Act provides that "All discharges of waste into the waters of the State are privileges, not rights."[1] Furthermore, all discharges are subject to regulation under the Porter-Cologne Act including both point and non-point source discharges.[2] In obligating the State Board and Regional Boards to address all discharges of waste that can affect water quality, the legislature provided the State Board and Regional Boards with authority in the form of administrative tools (waste discharge requirements (WDRs), waivers of WDRs, and Basin Plan waste discharge prohibitions) to address ongoing and proposed waste discharges. Hence, all current and proposed discharges must be

[1] See CWC section 13263(g).
[2] See CWC sections 13260 and 13376.

regulated under WDRs, waivers of WDRs, or a prohibition, or some combination of these administrative tools. Since the USEPA delegated responsibility to the State and Regional Boards for implementation of the National Pollutant Discharge Elimination System (NPDES) program, WDRs for discharges to surface waters also serve as NPDES permits.

The regulatory mechanisms used to implement the TMDL will include the Los Angeles County MS4 storm water permit, the Caltrans storm water permit, general industrial storm water permits, general construction storm water permits, minor NPDES permits, and general NPDES permits. Each NPDES permit assigned a WLA shall be reopened or amended at re-issuance, in accordance with applicable laws, to address implementation and monitoring of this TMDL and to be consistent with the waste load allocations of this TMDL.

The concentration-based waste load allocations for the minor NPDES permits and general non-storm water NPDES permits will be implemented through NPDES permit conditions. Permit writers for the non-storm water permits may translate applicable waste load allocations into effluent limits for the minor and general NPDES permits by applying applicable engineering practices.

The mass-based waste load allocations for the general construction and industrial storm water permittees will be incorporated into watershed specific general permits. Concentration-based permit limits may be set to achieve the mass-based waste load allocations. These concentration-based limits would be equal to the concentration-based waste load allocations assigned to the other NPDES permits. It is expected that permit writers will translate the waste load allocations into BMPs, based on BMP performance data. However, the permit writers must provide adequate justification and documentation to demonstrate that specified BMPs are expected to result in attainment of the numeric waste load allocations.

The MS4 and Caltrans permittees shall be allowed a phased implementation schedule to achieve the waste load allocations. A phased implementation approach, using a combination of non-structural and structural BMPs could be used to achieve compliance with the waste load allocations. The administrative record and the fact sheets for the MS4 and Caltrans storm water permits must provide reasonable assurance that the BMPs selected will be sufficient to implement the WLAs in the TMDL.

Potential Implementation Strategies

The implementation strategy selected will need to control the different sources of contaminant loading to Dominguez Channel and greater Harbor waters during dry and wet weather. During dry weather, metals, DDT, PAHs and PCBs loading are predominately in the dissolved phase as demonstrated by the default CTR conversion factors. During wet weather, metals DDT, PAHs, and PCBs are predominately bound to sediment, which are transported with storm runoff. Municipalities may employ a variety of implementation strategies to meet the required WLAs such as non-structural and structural best management practices (BMPs). Specific projects, which may have a significant environmental impact, would be subject to a separate environmental review. The lead agency for subsequent projects would be obligated to mitigate any impacts they identify, for example by mitigating potential flooding impacts by designing the BMPs with adequate margins of safety.

Non-Structural Best Management Practices

The non-structural BMPs are based on the premise that specific land uses or critical sources can be targeted to achieve the TMDL waste load allocations. Non-structural BMPs provide several advantages over structural BMPs. Non-structural BMPs can typically be implemented in a relatively short period of time. The capital investment required to implement non-structural BMPs is generally less than for structural BMPs. However, the labor costs associated with nonstructural BMPs may be higher, therefore, in the long-term the non-structural BMPs may be more costly. Examples of non-structural controls include more frequent and appropriately timed storm drain catch basin cleanings; improved street cleaning by upgrading to vacuum type sweepers; and, educating industries of good housekeeping practices.

Structural Best Management Practices

Structural BMPs may include placement of storm water treatment devices specifically designed to reduce sediment loading such as infiltration trenches or filters at critical points in the storm water conveyance system. During storm events, when flow rates are high these types of filters may require surge control, such as underground storage vaults or detention basins to avoid bypassing of the treatment unit.

The implementation plan will be critical for the success of the TMDLs, and staff will work closely with the stakeholders to come up with feasible options and time frames for meeting the load and waste load allocations.