Santa Monica Bay
Nearshore and Offshore Debris TMDL

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Introduction

The California Regional Water Quality Control Board, Los Angeles Region (Regional Board) has developed this total maximum daily load (TMDL) to attain the water quality standards for debris in the nearshore and offshore areas of Santa Monica Bay (Santa Monica Bay Debris TMDL). The TMDL has been prepared pursuant to state and federal requirements to preserve and enhance water quality for impaired waterbodies within the Coastal Watersheds of Los Angeles and Ventura Counties.

The California Water Quality Control Plan, Los Angeles Region (Basin Plan) sets standards for surface waters and ground waters in the Coastal Watersheds of Los Angeles and Ventura Counties. These standards are comprised of designated beneficial uses for surface and ground water, numeric and narrative objectives necessary to support beneficial uses, and the state's antidegradation policy. Such standards are mandated for all waters of the state under the Porter-Cologne Water Quality Act, and for waters of the U.S. under the Federal Clean Water Act. In addition, the Basin Plan describes implementation programs to protect all waters in the region. The Basin Plan implements the Porter-Cologne Water Quality Act (also known as the "California Water Code") and serves as the State Water Quality Control Plan applicable to the Santa Monica Bay, as required pursuant to the federal Clean Water Act (CWA). The Porter-Cologne Water Quality Control Act specifically addresses preproduction plastic debris (plastic resin pellets and powdered coloring for plastics). Chapter 5.2, Section 13367, requires the State and Regional Boards to implement a program for the control of preproduction plastics from point and nonpoint sources.

Section 305(b) of the CWA mandates biennial assessment of the nation's water resources, and these water quality assessments are used to identify and list impaired waters. The resulting list is referred to as the 303(d) list. The CWA also requires states to establish a priority ranking for impaired waters and to develop and implement TMDLs. A TMDL specifies the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and allocates pollutant loadings to point and nonpoint sources.

The United States Environmental Protection Agency (USEPA) has oversight authority for the 303(d) program and must approve or disapprove the state's 303(d) lists and each specific TMDL. USEPA is ultimately responsible for issuing a TMDL, if the state fails to do so in a timely manner.

As part of California's 1998, 2002, and 2006 303(d) list submittals, the Regional Board identified the nearshore and offshore areas of Santa Monica Bay as being impaired by debris.

A consent decree between the USEPA, the Santa Monica BayKeeper and Heal the Bay Inc., represented by the Natural Resources Defense Council (NRDC), was signed on March 22, 1999. The Consent Decree requires that all TMDLs for the Los Angeles Region be addressed within 13 years. The consent decree also prescribes schedules for

certain TMDLs. The TMDL for the nearshore and offshore areas of Santa Monica Bay corresponds to Analytical Unit #66 of the Consent Decree.

This TMDL staff report and accompanying Basin Plan amendment establish the numeric targets for trash and plastic pellet discharges, baseline and final waste load allocations for point source trash and plastic pellets, and baseline and final load allocations for nonpoint source trash, a margin of safety, a program of implementation for point and nonpoint sources, an implementation schedule, and monitoring requirements.

The Debris TMDL for the nearshore and offshore areas of Santa Monica Bay will be adopted as an amendment to the Basin Plan and is therefore subject to Public Resources Code Section 21083.9 that requires California Environmental Quality Act (CEQA) Scoping and Analysis to be conducted for Regional Projects. CEQA Scoping involves identifying a range of project/program related actions, alternatives, mitigation measures, and significant effects to be analyzed in an EIR or its Substitute Environmental Documents (SEDs). On March 23, 2010 a CEQA Scoping meeting was held at the Hyperion Treatment Plant to present and discuss the foreseeable potential environmental impacts of compliance with the Debris TMDL for the nearshore and offshore areas of Santa Monica Bay. Notice of the CEQA Scoping meeting was circulated in the Los Angeles Times on February 19, 2010 and posted on the Regional Board's website. Electronic notification was also sent to interested parties including cities and/or counties with jurisdiction in or bordering the watershed of concern. Input from all stakeholders and interested parties was solicited for consideration in the development of the CEQA documents.

The Santa Monica Bay Debris TMDL is based on existing, readily available information concerning the conditions in Santa Monica Bay and the contributing watershed areas, as well as TMDLs previously developed by the State and USEPA.

I. Problem Statement

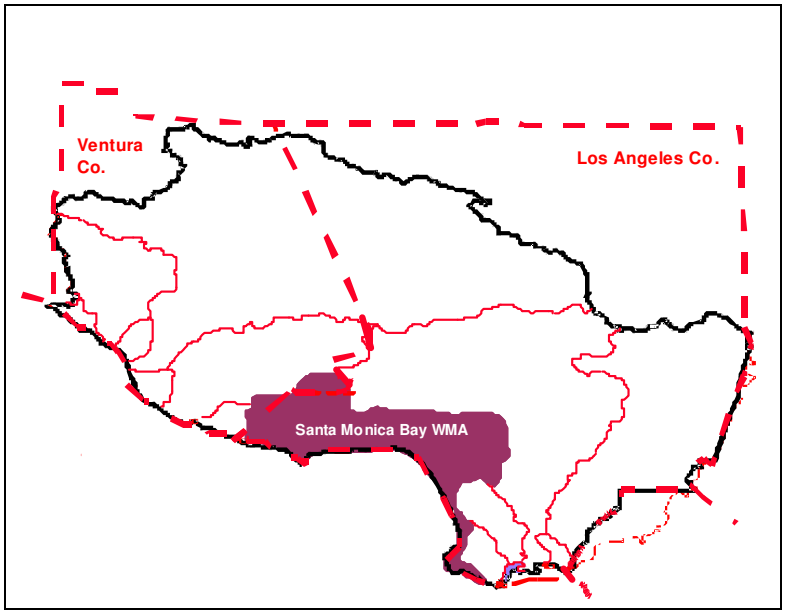
The problem statement consists of descriptions of the waterbody and watershed, the waterbody's designated beneficial uses, applicable water quality objectives, and impairments caused by debris to the nearshore and offshore areas of the Santa Monica Bay.

A. Description of the Santa Monica Bay Watershed

The Santa Monica Bay is an integral part of the larger geographic region commonly known as the Southern California Bight. It is bordered offshore by the Santa Monica Basin, to the north by the rocky headlands of Point Dume and to the south by the Palos Verdes Peninsula, and onshore by the Los Angeles Coastal Plain and the Santa Monica Mountains. The 414 square mile area of land that drains naturally to the Bay, known as the Santa Monica Bay watershed, is bordered on the north by the Santa Monica Mountains from the Ventura-Los Angeles County line to Griffith Park, extending south

and west across the Los Angeles coastal plain to include the area east of Ballona Creek and north of Baldwin Hills. South of Ballona Creek, a narrow coastal strip between Playa del Rey and the Palos Verdes Peninsula forms the southern boundary of the watershed. Figure 1 illustrates the county lines and the boundaries of the Santa Monica Bay Watershed.

Figure 1. Santa Monica Bay Watershed Management Area



The Santa Monica Bay itself is the submerged portion of the Los Angeles Coastal Plain. The continental shelf extends seaward to the shelf break about 265 feet underwater, then drops steeply to the Santa Monica Basin at about 2,630 feet.

The Debris TMDL addresses nearshore and offshore Santa Monica Bay. Nearshore Santa Monica Bay is defined by the Ocean Plan as, within a zone bounded by the shoreline and a distance of 1,000 feet from the shoreline or the 30-foot contour, whichever is further from the shoreline. Offshore is defined as the waters between the nearshore zone and the limit of state waters. Lastly, state waters, according to section 13200 of the California Water Code, extend three nautical miles into the Pacific Ocean from the line of mean lower low water marking the seaward limits of inland waters and three nautical miles from the line of mean lower low water on the mainland and each offshore island.

The Santa Monica Bay watershed has an estimated population of 1,950,265 based on the 2000 U.S. Census. Open space represents the primary land use in the watershed (55%), while high-density residential areas represent the largest developed area (25% of the total watershed). Low-density residential constitutes 5% of the land area. Commercial, industrial and mixed urban areas cover 10%. The remaining 5% of land area is covered by transportation (1.7%), educational institutions (1.6%), agriculture (0.8%),

recreational uses (0.8%), public facilities and military installations (0.2%), and water (0.4%).

In general, the northern part of the Santa Monica Bay (northwest of Santa Monica subwatershed) is not as highly developed and urbanized as the southern part of the Bay (southeast of Santa Monica Canyon subwatershed). Subwatersheds in the northern part of the Bay have on average 85% of their land area in open space. Subwatersheds in the central and southern portion of the Bay have on average 16% of their area in open space.

A.1 Santa Monica Bay Subwatersheds

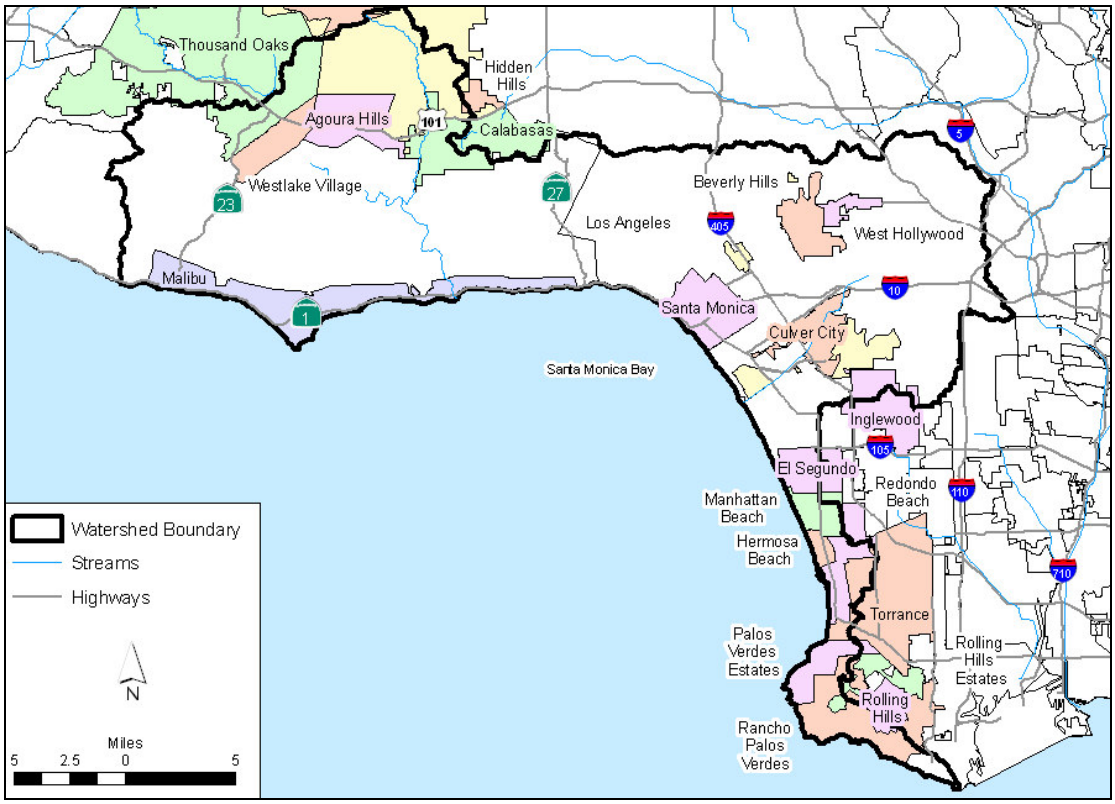
Table 1 lists the 28 separate sub-watersheds and associated cities within the larger Santa Monica Bay watershed (Figure 2). The three largest are Ballona Creek, Malibu Creek, and Topanga Canyon watershed. There are existing trash TMDLs for the Ballona Creek Watershed and the Malibu Creek Watershed. The Ballona Creek Trash TMDL became effective on August 11, 2005, and the Malibu Creek Trash TMDL became effective on March 17, 2009.

Table 1. Subwatersheds of the Santa Monica Bay

Subwatershed	City
Arroyo Sequit	Malibu, Los Angeles County Unincorporated
Ballona Creek	Culver City, Inglewood, Los Angeles, Beverly Hills, West Hollywood, Marina del Rey, Santa Monica, Los Angeles County Unincorporated
Carbon Canyon	Malibu, Los Angeles County Unincorporated
Castle Rock	Los Angeles, Los Angeles County Unincorporated
Corral Canyon	Malibu, Los Angeles County Unincorporated
Dockweiler	El Segundo, Los Angeles, Manhattan Beach, Los Angeles County Unincorporated
Encinal Canyon	Malibu, Los Angeles County Unincorporated
Escondido Canyon	Malibu, Los Angeles County Unincorporated
Hermosa	El Segundo, Hermosa Beach, Manhattan Beach, Redondo Beach
Las Flores Canyon	Malibu, Los Angeles County Unincorporated
Latigo Canyon	Malibu, Los Angeles County Unincorporated
Los Alisos Canyon	Malibu, Los Angeles County Unincorporated
Malibu Creek	Agoura Hills, Calabasas, Hidden Hills, Simi Valley, Thousand Oaks, Westlake Village, Malibu, Los Angeles County Unincorporated, Ventura County Unincorporated
Nicholas Canyon	Malibu, Los Angeles County Unincorporated
Palos Verdes	Los Angeles, Palos Verdes Estates, Rancho Palos Verdes, Redondo Beach, Rolling Hills, Rolling Hills Estates, Torrance, Los Angeles County Unincorporated
Pena Canyon	Malibu, Los Angeles County Unincorporated
Piedra Gorda Canyon	Malibu, Los Angeles County Unincorporated
Pulga Canyon	Los Angeles
Ramirez Canyon	Malibu, Los Angeles County Unincorporated

Redondo	Hermosa Beach, Manhattan Beach, Redondo Beach, Torrance, Los Angeles County Unincorporated
Santa Monica	Los Angeles, Santa Monica, Los Angeles County Unincorporated
Santa Monica Canyon	Los Angeles, Santa Monica
Santa Ynez	Los Angeles
Solstice Canyon	Malibu, Los Angeles County Unincorporated
Topanga Canyon	Calabasas, Los Angeles, Los Angeles County Unincorporated
Trancas Canyon	Malibu, Los Angeles County Unincorporated
Tuna Canyon	Malibu, Los Angeles County Unincorporated
Zuma Canyon	Malibu, Los Angeles County Unincorporated

Figure 2. Cities in the Santa Monica Bay Watershed



A.1.1 Ballona Creek Subwatershed

The largest subwatershed of Santa Monica Bay is the Ballona Creek Watershed, which covers approximately 130 square miles, and is located in the coastal plain of the Los Angeles Basin (Figure 3). Its boundaries are defined by the Santa Monica Mountains to the north, the Harbor Freeway (110) to the East, and Baldwin Hills to the south. Ballona Creek Watershed includes the Cities of Beverly Hills and West Hollywood, and portions of the cities of Culver City, Inglewood, Los Angeles, Santa Monica, and unincorporated areas of Los Angeles County. The Ballona Creek Watershed is highly

developed with high-density single family residential, multiple family residential, and mixed residential areas as the primary land uses in the watershed.

Ballona Creek is a concrete-lined, open channel for just under 10 miles which flows from Los Angeles (south of Hancock Park) through Culver City, eventually transitioning to the Ballona Creek Estuary, where concrete is replaced by grouted riprap side slopes and a natural bottom. Ballona Creek Estuary empties into the Pacific Ocean at Dockweiler Beach in Playa del Rey. Ballona Creek is fed by a complex underground network of storm drains, which reaches north to Beverly Hills and West Hollywood. Tributaries of the creek and estuary include Centinela Creek, Sepulveda Canyon Channel, Benedict Canyon Channel, and numerous storm drains. Ballona Creek is designed to discharge to Santa Monica Bay approximately 71,400 cubic feet per second from a 50-year frequency storm event (LADPW).

A.1.2 Malibu Creek Subwatershed

The next largest subwatershed of the Santa Monica Bay watershed is the Malibu Creek watershed. The Malibu Creek Watershed is 109 square miles, and is located roughly 35 miles west of Los Angeles. The Malibu Creek Watershed extends north from Santa Monica Bay and through the Santa Monica Mountains to the Simi Hills and Santa Susanna Mountains. The watershed is defined by US Highway 101 (Ventura Freeway) and California Highway 1 (Pacific Coast Highway). The Malibu Creek watershed encompasses unincorporated portions of Ventura and Los Angeles Counties, and seven cities including Malibu, Calabasas, Agoura Hills, Thousand Oaks, and Westlake Village and portions of Simi Valley and Hidden Hills. The dominant land use in this subwatershed is open space. Other land uses include: agriculture, recreation, and urbanized land uses including high and low density residential areas and commercial and industrial areas. Malibu Creek State Park is located in the Malibu Creek watershed.

Malibu Creek flows year-round, beginning at Malibou Lake and ending at Malibu Lagoon, where Malibu Creek empties into the Pacific Ocean in Santa Monica Bay. Malibu Creek is approximately 11 miles long, and is a receiving water body of urban and stormwater runoff from a network of storm drains and various types of open space throughout the watershed. Tributaries of Malibu Creek start in the Santa Monica Mountains and include the following: Lindero Canyon Creek, Lake Lindero, Medea Creek, Palo Comado Canyon Creek, Cheeseboro Canyon Creek, Las Virgenes Creek, Hidden Valley Creek, Lake Sherwood, Potrero Valley Creek, Westlake Lake, Triunfo Creek, Lake Enchanto, Malibou Lake, Malibu Creek, Las Virgenes Creek, Malibu Lagoon and Cold Creek. Malibu Creek outlets to the Santa Monica Bay through Malibu Lagoon at Surfrider Beach.

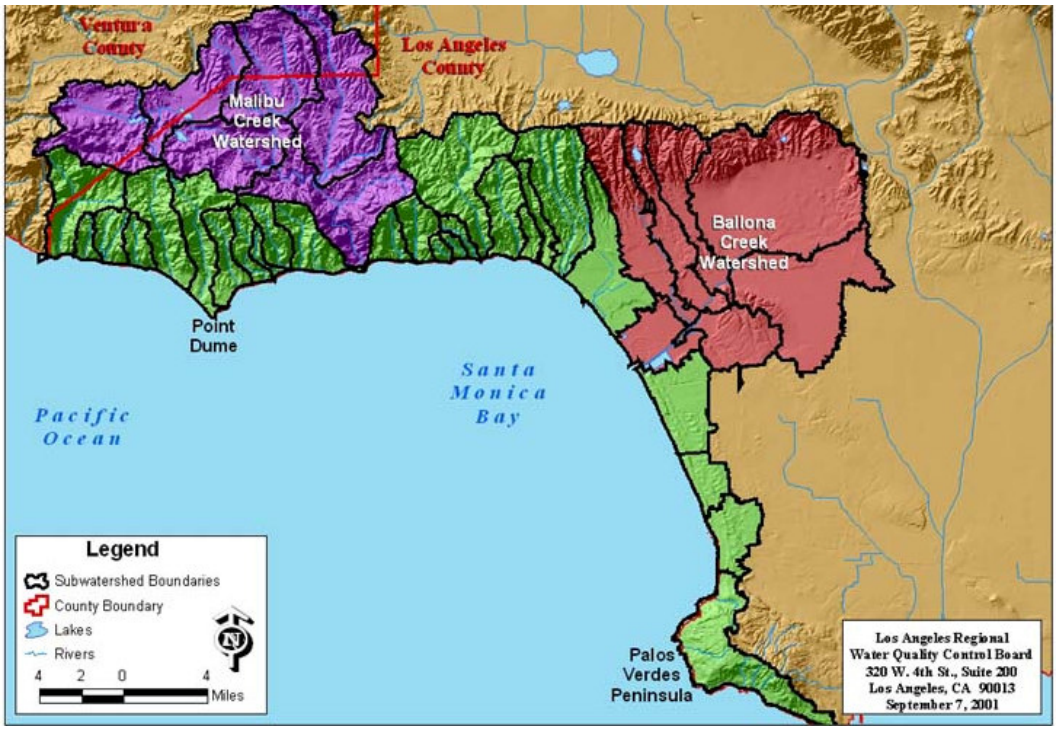
A.1.3 Topanga Canyon Subwatershed

The other major subwatershed in the Santa Monica Bay watershed is the Topanga Canyon watershed, which covers approximately 18 square miles. It is bounded on three sides by State Park or conservancy lands, and on the south by the Pacific Ocean and a small strip of Malibu, and Pacific Palisades to the east. Topanga Beach is on the coast at the outlet of Topanga Creek, just south of Malibu. Topanga Canyon contains lands of

both Topanga State Park, which is the largest park in the Santa Monica Mountains, and the Santa Monica Mountains Conservancy. Topanga State Park is part of the Santa Monica Mountains National Recreation Area. Although there are residential areas in the Topanga Canyon watershed, a large portion of the watershed is undeveloped.

Topanga Creek drains Topanga Canyon, and is one of the few remaining undammed waterways in the area. Topanga Canyon Boulevard is the main thoroughfare connecting the Ventura Freeway (US 101) with Pacific Coast Highway (SR 1). The southern portion of the boulevard largely parallels Topanga Creek.

Figure 3. Major Subwatersheds, Streams, and Lakes of the Santa Monica Bay Watershed



A.2 Santa Monica Bay Beaches

Santa Monica Bay is surrounded by fifty-five miles of shoreline and numerous public beaches. As there are differences in the characteristics and land uses of the beaches along the Santa Monica Bay, in this TMDL the beaches have been separated into north bay and south bay beaches. The north bay beaches are located north of the City of Santa Monica, while those referred to as south bay beaches are south of Santa Monica.

The north bay beaches are generally flanked by more open space and roads, as the northern Santa Monica Bay watershed is not as urbanized as the southern part of the watershed. North of Santa Monica, Pacific Coast Highway parallels the coastline and the beaches along the bay.

The beaches located in the south Santa Monica Bay area are commonly adjacent to residential areas. For example, there are high-density residences along The Strand directly adjacent to Redondo, Hermosa, and Manhattan Beach.

Dockweiler State Beach, located in mixed areas containing residences and open space, is the largest beach in both length and acreage in the south bay. It stretches 3.8 miles, and covers 255 acres (County of Los Angeles, Department of Beaches and Harbors).

There are numerous storm drains and 40 dry weather diversions and three treatment facilities that end at the beaches of the Santa Monica Bay. Refer to the point sources section of the Source Analysis chapter for a map and list of locations.

Los Angeles County Department of Beaches and Harbors, California Department of Parks and Recreation, City of Los Angeles, City of Santa Monica, and City of Hermosa Beach own and/or operate a majority of the beaches along the Santa Monica Bay, as seen in Table 2 and Figure 4.

Table 2. Management of Santa Monica Bay Beaches

Beaches Operated by Los Angeles County Department of Beaches and Harbors
Point Dume Beach
Latigo Shores County Beach
Dan Blocker Memorial Beach
Malibu Lagoon (Surfrider) Beach
Las Tunas Beach
Topanga Beach
Will Rogers State Beach (owned by the State of California)
Venice Beach (owned by the City of Los Angeles)
Marina Beach
Dockweiler State Beach (owned by the State of California)
Manhattan Beach
Hermosa Beach (owned by the City of Hermosa Beach)
Redondo Beach
Torrance Beach
Beach Operated by City of Santa Monica
Santa Monica State Beach (owned by the State of California)

Figure 4. Beaches owned and operated by Department of Beaches and Harbors

BEACH	OWNED BY	OPERATED BY
Nicholas Canyon	DBH	DBH
El Sol	DBH	DBH
Zuma	DBH	DBH
Point Dume	DBH	DBH
Latigo Shores	DBH	DBH
Dan Blocker	DBH	DBH
Malibu Lagoon	DBH	DBH
Las Tunas	DBH	DBH
Topanga	DBH	DBH
Will Rogers State Beach	State of CA	DBH (for the City of L.A.)
Venice	City of L.A.	DBH
Marina Beach	DBH	DBH
Dockweiler State Beach	State of CA	DBH (for the City of L.A.)
Manhattan Beach	DBH	DBH (except pier)
Hermosa Beach	City of Hermosa Beach	DBH
Redondo Beach	DBH	DBH (except pier)
Torrance	DBH	DBH
White Point / Royal Palms	DBH	DBH
Point Fermin	City of L.A.	DBH (beach only)

A.3 Santa Monica Bay

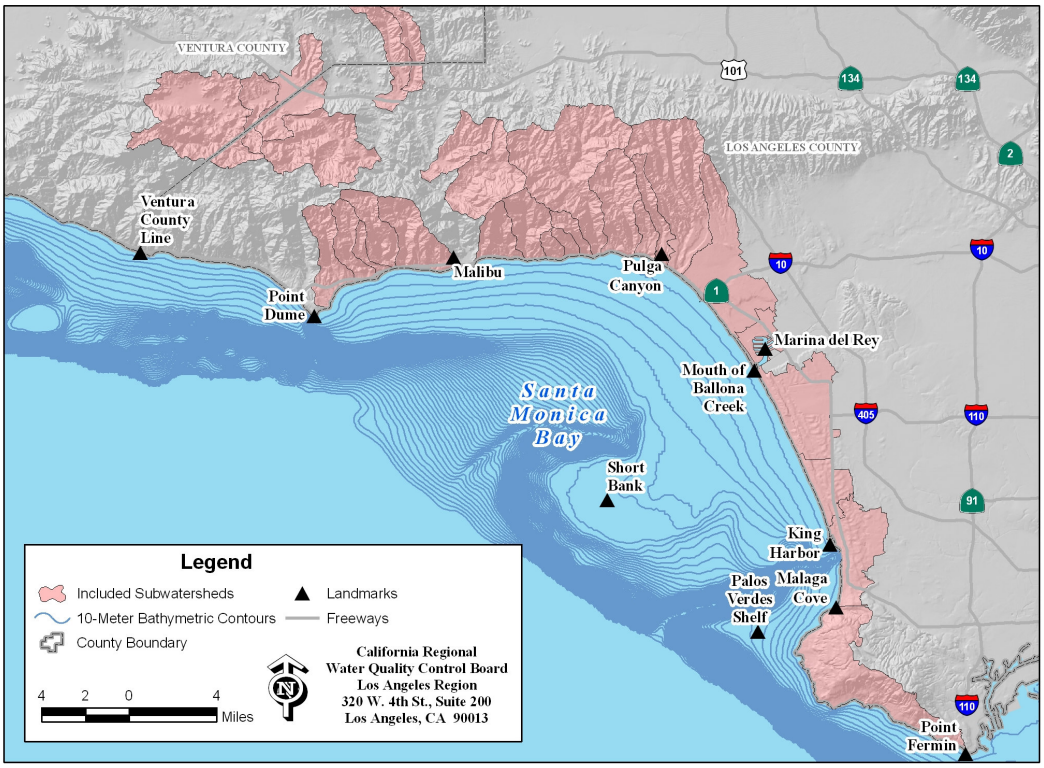
Santa Monica Bay is comprised of different geological substrate types within nearshore and offshore areas: rocky intertidal, soft bottom, and hard bottom. Figure 5 shows a map of the landmarks described in the various substrate types, below.

Rocky intertidal areas and areas of mixed rocky and sandy shoreline cover approximately 30% or 20 miles (32 km) of the Bay's coastline. Exposed bedrock forms the rocky intertidal from the Ventura County line to Pulga Canyon in Malibu and from Malaga Cove to Point Fermin on the Palos Verdes shelf (MBC Applied Environmental Sciences 1993). Artificial rocky intertidal—jetties, breakwater, rip rap—exist in Marina del Rey; the mouth of Ballona Creek; and King Harbor (MBC Applied Environmental Sciences 1988).

Unconsolidated, soft sediment, generally with the composition of sand, silt, and clay, makes up most of the Bay's seafloor. Silty sand is found over the central plateau and the Palos Verdes Shelf. The soft-bottom in Santa Monica Bay ranges in depth from the mean lower low water line (MLLW) to deeper than 500 meters in the outer portions of the bay and the submarine canyons (Robbins, 2006).

Hard bottom environments in Santa Monica Bay include the shallow kelp-covered areas adjacent to rocky headlands, submarine canyon walls, and the deep-water plateau called Short Bank. A large gravel bed surrounds the rocky outcrops of Short Bank. Additionally, man-made features such as wastewater treatment plant outfall pipes, artificial reefs, and breakwaters are part of the hard bottom. (MBC Applied Environmental Sciences 1993).

Figure 5. Landmarks of the Santa Monica Bay



B. Climate

The Santa Monica Bay Watershed is located in the Southern California coastal belt and has a warm, Mediterranean climate. Summer is typically hot inland, and winter is mild. The average January air temperature is 53 degrees Fahrenheit, while the average July air temperature is 71 degrees Fahrenheit. The average annual air temperature is 61 degrees Fahrenheit with an average frost free season of 275 to 325 days.

Storm events and the resulting high stream flows are highly seasonal, grouped heavily in the months between November and April. Rainfall is rare in other months, and major storm flows historically have not been observed outside of the wet-weather season.

C. Beneficial Uses of Santa Monica Bay

The various uses of waters in the Los Angeles Region, referred as beneficial uses, are designated in the Basin Plan. These beneficial uses are the cornerstone of the State and Los Angeles Regional Water Quality Control Board's effort to protect water quality, as water quality objectives are set at levels that will protect the most sensitive beneficial use of a waterbody.

The Basin Plan for the Los Angeles Regional Board defines several beneficial uses in the Santa Monica Bay Watershed. Debris loading to the Santa Monica Bay

causes impairments to beneficial uses associated with industrial service supply (IND), navigation (NAV), water contact recreation (REC-1), non-contact water recreation (REC-2), commercial and sport fishing (COMM), estuarine habitat (EST), marine habitat (MAR), preservation of biological habitats (BIOL), migration of aquatic organisms (MIGR), wildlife habitat (WILD), rare, threatened, or endangered species (RARE), spawning, reproduction, and or early development (SPWN), shellfish harvesting (SHELL), and wetland habitat (WET). These beneficial uses are summarized in Table 3.

The diverse ecosystems within the Santa Monica Bay Watershed provide a variety of habitats for more than five thousand species of plants, fish, birds, mammals, and other wildlife. The Bay's terrestrial habitats include riparian woodlands, coastal sage scrub, oak woodlands, coastal sand dunes, salt and brackish marshes, lagoons, and mudflats. Marine habitats include soft and hard bottom, sandy and rocky intertidal, pelagic, and kelp and seagrass beds (Santa Monica Bay Restoration Plan, 1994).

C.1 Santa Monica Bay

The Santa Monica Bay itself provides habitat for several different species. Below is a description of some of the specific aquatic life and recreational beneficial uses of the various marine habitats in the Bay.

C.1.1 Rocky Intertidal

The rocky intertidal areas are an important interface between the sea and the land, providing habitat for numerous and diverse species in the Bay. Various species of rockfish, such as the grass rockfish, kelp rockfish, and olive rockfish live and forage in rocky intertidal areas. In addition, the black abalone is a rocky intertidal species that has faced a rapid decline. Rocky intertidal areas can also have a recreational use, as people visit tidepools to explore and enjoy the life this habitat provides.

C.1.2 Soft Bottom Habitat

Fish use soft bottom habitat for all life stages. Soft bottom habitat supports a large number of organisms, including more than 100 species of demersal or bottom-dwelling fish, including White croaker, Queenfish, Surfperch, California halibut, and Barred sandbass. Eelgrass grows in the soft bottom habitat of Santa Monica Bay, and provides several fish species a food source and shelter (Allen 1999). Bocaccio, lingcod, California halibut, Pacific sanddab, and several species of rockfish also associate with the soft bottom habitat.

C.1.3 Hard Bottom Habitat

Although hard bottom habitat is scarce in the Bay, it supports a unique and productive ecosystem. Bocaccio, lingcod, and several species of rockfish live and forage in natural and artificial hard bottom habitats. In addition, kelp beds are associated with hard bottom habitats. Hard bottom habitat also includes commercial and recreational uses, such as commercial and recreational fishing, and scuba diving.

C.1.4 Kelp Beds

Kelp beds extend low relief, hard bottom habitat from the seafloor to the surface, creating a vertically structured habitat. Fish may inhabit one of more of the following region of the kelp bed: holdfast, stipe, or canopy (MBC Applied Environmental Sciences). The giant kelp beds off of southern California are one of the most biodiverse communities known to exist in our world's oceans. In California, kelp beds provide protection and habitat for more than 800 species of fishes and invertebrates, many of which are uniquely adapted for life in kelp forests. One-fourth of California marine organisms depend on the kelp forests for some part of their life cycle. The survival of the threatened bocaccio, giant black sea bass, and entire industries are dependent on large, stable kelp beds (Santa Monica BayKeeper website, 2010).

Because most established kelp beds occur over hard bottom substrate, giant kelp beds in Santa Monica Bay are limited to two areas, the Palos Verdes Shelf and the area from Malibu west to Point Dume. Kelp beds grow on hard bottoms at depths ranging from 8 to 18 meters (Allen, 1985).

C.1.5 Pelagic

Pelagic, or open water, habitat is the most extensive of any of the coastal and marine habitats in the Bay. The pelagic habitat is from the sea surface to the ocean bottom, and is free of direct influence from the shore or ocean bottom.

The vast majority of life in the Bay depends either directly or indirectly on phytoplankton found in the pelagic realm. Phytoplankton forms the base of the food web – they support grazing zooplankton, fish, and marine bacteria. In the Southern California Bight, the pelagic realm is home to 40% of the total fish species. Small fish, such as northern anchovies, pacific sardines, and pacific mackerel school and reside in the pelagic realm, as well. In addition, several species of rockfish release larvae in pelagic waters. The open Bay also supports numerous species of seabirds, including the endangered California brown pelican and California least tern. Furthermore, several species of marine mammals are frequently observed in the open Bay.

C.2 Santa Monica Bay Beaches

Santa Monica Bay's sandy beaches are heavily used as a recreational resource by residents of Los Angeles and Ventura Counties, and visitors from around the world. Bay beaches attract, on average, 50-60 million visitors per year and generate significant revenue for the local economy. The intense recreational use of Santa Monica Bay's beaches has impacted both the habitat and the associated species. Sandy beaches are important foraging and nesting grounds for many shore bird species. The protection of this habitat is central to the population recovery of two endangered species, the California least tern and Western snowy plover. Although the snowy plover no longer nests along Santa Monica Bay beaches due to habitat loss/degradation as well as human disturbance, the plover still winters on Bay beaches and is therefore still vulnerable (Santa Monica Bay Restoration Commission website, 2010).

Table 3. Beneficial Uses of Coastal Features, Santa Monica Bay.

Coastal Feature[a]	Beneficial Uses	IND	NAV	REC1	REC2	COMM	EST	MAR	WILD	BIOL	RARE	MIGR	SPWN	SHELL	WET[b]
Los Angeles County Coastal	Hydro Unit #														
Nearshore Zone*		E	E	E	E	E		E	E	Ean	Ee	Ef	Ef	Ear	
Offshore Zone		E	E	E	E	E		E	E		Ee	Ef	Ef	E	
Escondido Beach	404.34		E	E	E	E		E	E				P	E	
Dan Blocker Memorial (Corral) Beach	404.31		E	E	E	E		E	E				P	E	
Puerco Beach	404.31		E	E	E	E		E	E				P	E	
Amarillo Beach	404.21		E	E	E	E		E	E				P	E	
Malibu Beach	404.21		E	E	E	E		E	E			E	Eas	Ear	
Malibu Lagoon	404.21		E	E	E		E	E	E		Ee	Ef	Ef		E
Carbon Beach	404.16		E	E	E	E		E	E				P	E	
La Costa Beach	404.16		E	E	E	E		E	E				P	E	
Las Flores Beach	404.15		E	E	E	E		E	E				P	E	
Las Tunas Beach	404.12		E	E	E	E		E	E				P	E	
Topanga Beach	404.11		E	E	E	E		E	E				P	E	
Topanga Lagoon	405.11		E	E	E	E	E		E		Ee	Ef	Ef		E
Will Rogers State Beach	405.13		E	E	E	E		E	E				P	E	
Santa Monica Beach	405.13		E	E	E	E		E	E			E	Eas	E	
Venice Beach	405.13		E	E	E	E		E	E		E	E	Eas	E	
Marina Del Rey				E											
Harbor	405.13		E	E	E	E		E	E					E	
Public Beach Areas	405.13		E	E	E	E		E	E		E				
All other Areas	405.13		E	P	E	E		E	E		E			E	
Entrance Channel	405.13		E	E	E	E		E	E		E			E	
Ballona Creek Estuary	405.13		E	E	E	E	E	E	E		Ee	Ef	Ef	E	
Ballona Lagoon/Venice Canals	405.13		E	E	E	E	E	E	E		Ee	Ef	Ef	E	E
Ballona Wetlands	405.13			E	E		E		E		Ee	Ef	Ef		E
Del Rey Lagoon	405.13			E	E		E		E		Ee	Ef	Ef		E
Dockweiler Beach	405.12	E	E	E	E	E		E	E				P		
Manhattan Beach	405.12		E	E	E	E		E	E				P	E	
Hermosa Beach	405.12		E	E	E	E		E	E				Eas	E	
King Harbor	405.12	E	E	E	E	E		E	E		E				
Redondo Beach	405.12	E	E	E	E	E		E	E		E	E	Eas	E	
Torrance Beach	405.12		E	E	E	E		E	E			E	Eas	E	
Point Vicente Beach	405.11		E	E	E	E		E	E				P	E	

E: Existing beneficial use
P: Potential beneficial use
I: Intermittent beneficial use
a: Waterbodies are listed multiple times if they cross hydrologic area or subarea boundaries. Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.
b: Waterbodies designated as WET may have wetlands habitat associated with only a portion of the waterbody. Any regulatory action would require a detailed analysis of the area.
e: One or more rare species utilize all ocean, bays, estuaries, and coastal wetlands for foraging and/or nesting.
f: Aquatic organisms utilize all bays, estuaries, lagoons, and coastal wetlands, to a certain extent, for spawning and early development. This may include migration into areas which are heavily influenced by freshwater inputs.
an: Areas of Special Biological Significance (along coast from Latigo Point to Laguna Point) and Big Sycamore Canyon and Abalone Cove Ecological Reserves and Point Fermin Marine Life Refuge.
ar: Areas exhibiting large shellfish populations include Malibu, Point Dume, Point Fermin, White Point, and Zuma Beach.
as: Most frequently used grunion spawning beaches. Other beaches may be used as well.
* Nearshore is defined as the zone bounded by the shoreline and a line 1000 feet from the shoreline or the 30-foot contour, whichever is further from the shore line.

C.3 Santa Monica Bay Subwatersheds

The Ballona Creek Subwatershed, Malibu Creek Subwatershed, and Topanga Canyon Subwatershed are all ecologically significant watersheds located within the Santa Monica Bay Watershed.

C.3.1 Ballona Creek Subwatershed

Ballona Creek, the largest subwatershed in the Santa Monica Bay watershed, is ecologically and recreationally significant. The bike path along the creek provides opportunities for recreation in the area. This path extends almost seven miles from Ballona Creek at National Boulevard in Culver City, to the end of Ballona Creek Estuary in Marina del Rey. The bike path is connected to another path along Dockweiler Beach by the Pacific Bridge, which links Marina del Rey to Playa del Rey. Biking, walking, drawing and painting are common practices that take place along the bikepath.

In addition to biking, hiking and bird watching are common practices in the watershed. About 300 bird species have been recorded in the Ballona Creek Subwatershed, including water, marsh, shore, and sea birds. Some of these birds are threatened and endangered species. For example, the California least tern is an endangered species that forages at the freshwater marsh during the breeding season, and raises its young in the sand dunes at Venice Beach. The great blue heron nests in tall trees in upland areas of Ballona, and forages along Ballona Creek. The Belding's savannah sparrow, a State listed endangered species, forages and breeds primarily in high salt marsh habitat. The least bittern, a State Species of Special Concern, breeds at the Freshwater Marsh.

C.3.2 Malibu Creek Subwatershed

The second largest of Santa Monica Bay's subwatersheds, the Malibu Creek Watershed, is the most ecologically significant watershed in Los Angeles County and the Santa Monica Mountains National Recreation Area (SMMNRA). The Malibu Creek Watershed provides a wide variety of habitats for threatened and endangered species and has long been a popular locale for public access and public recreation. Some animal species, such as the steelhead trout, tidewater goby, and brown pelican are endangered. Many others, such as the snowy plover and peregrine falcon, are threatened. As a large percentage of the Malibu Creek Watershed includes large areas of open space and natural habitat, it also provides many recreational opportunities. Hiking, mountain biking, fishing, horseback riding trails, camping, swimming and birdwatching are all common activities. In addition, Malibu Beach is a popular spot for vacationers, beachgoers, and surfers. The Malibu Creek Watershed has also been the location of many movie studio sets.

C.3.3 Topanga Canyon Subwatershed

The third largest subwatershed of the Santa Monica Bay watershed, Topanga Canyon watershed, is a favorite spot for hikers, bikers, and motorcycle riders because of its location in the Santa Monica Mountains. Biodiversity in Topanga watershed is quite high, with many species present that are rare in other areas of the Santa Monica Mountains. Sensitive plant species found in Topanga include Braunton's milkvetch, Santa Monica Mountains Dudleya, and Santa Susana Tarplant. Several sensitive animal species have been found in Topanga, including the steelhead trout, California newt, Arboreal salamander, and the California Red-legged frog.

D. Water Quality Objectives

Narrative water quality objectives are specified by the 1994 Los Angeles Regional Board Basin Plan. Water quality standards consist of a combination of beneficial uses, water quality objectives, and the State's Antidegradation Policy. Regional Board staff finds that the following narrative objectives are most pertinent to the Santa Monica Bay Debris TMDL:

Floating Materials: *"Waters shall not contain floating materials, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses."*

Solid, Suspended, or Settleable Materials: *"Waters shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses."*

In addition, the 2005 Water Quality Control Plan for Ocean Waters of California (California Ocean Plan) establishes water quality objectives, as well. This narrative objective is applicable to both trash and plastic pellets:

"Floating particulates and grease and oil shall not be visible."

Moreover, in 2007 AB 258 was signed into law, which added Chapter 5.2 to Division 7 of the California Water Code, section 13367. Chapter 5.2 is called "Preproduction Plastic Debris Program," and requires the Regional Boards to implement a program to control the discharges of preproduction plastic pellets from point and nonpoint sources. The program requires plastic manufacturing, handling, and transportation facilities to implement best management practices to control discharges of preproduction plastics, including: appropriate containment systems; sealed containers durable enough so as not to rupture during transfer and storage; use of capture devices during loading, unloading, and transferring; and the availability of a vacuum or vacuum like system to clean up loose pellets.

State Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality Water" in California, known as the "Antidegradation Policy," protects high quality surface and ground waters from degradation. Any actions that can adversely affect water quality in all surface and ground waters must be consistent with the maximum benefit to the people of the state, must not unreasonably affect present and anticipated beneficial use of such water, and must not result in water quality less than that prescribed in water quality plans and policies. Furthermore, any actions that can adversely affect surface waters are also subject to the federal Antidegradation Policy (40 CFR 131.12). The proposed TMDL will not degrade water quality, and will in fact improve water quality as it is designed to achieve compliance with existing water quality standards.

E. Impairment of Beneficial Uses

The beneficial uses described above are impaired by the accumulation of suspended and settleable debris. Common items that have been observed by Regional Board staff include

plastic bags, aluminum cans, paper items, plastic and glass bottles, styrofoam, plastic pellets, cigarette butts, and construction debris. Heavier debris can also be transported during storms.

Marine debris[1] has impacted at least 267 species worldwide, primarily through ingestion and entanglement (Heal the Bay, 2007). Marine debris and beach litter kills marine wildlife, damages the Bay's aesthetic qualities, and is expensive for coastal communities to clean up. Items like fishing line and six-pack rings can entangle marine animals. Entanglement results when an animal becomes encircled or ensnared by debris. It can occur accidentally, or when the animal is attracted to the debris as part of its normal behavior or out of curiosity. Entanglement is harmful to wildlife for several reasons. Not only can it cause wounds that can lead to infections or loss of limbs; it can also cause strangulation or suffocation. In addition, entanglement can impair an animal's ability to swim, which can result in drowning, or in difficulty in moving, finding food, or escaping predators (U.S. EPA, 2001). Once entangled, animals have trouble eating, breathing or swimming, all of which can have fatal results.

For aquatic life, buoyant (floatable) elements tend to be more harmful than settleable elements, due to their ability to be transported throughout the water body and ultimately to the marine environment. Birds, fish and mammals often mistake plastic for food. With plastic filling their stomachs, animals have a false feeling of being full, and may die of starvation. Sea turtles mistake plastic bags for jellyfish, one of their favorite foods. Even gray whales have been found dead with plastic bags and sheeting in their stomachs. Smaller elements such as plastic resin pellets (a by-product of plastic manufacturing) and cigarette butts are often more harmful to aquatic life than larger elements, since they can be ingested by a large number of small organisms which can then suffer malnutrition or internal injuries. In addition to malnutrition, plastic pellets may contain chemicals that are toxic (e.g. persistent organic pollutants). These toxic substances may be additives that were intentionally mixed into the resin to achieve specific properties, or contaminants that were adsorbed by the pellets from the environment (U.S. EPA, 1992).

Ingestion of sharp objects can damage the mouth, digestive tract and/or stomach lining and cause infection or pain. Ingested items can also block air passages and prevent breathing, thereby causing death (U.S. EPA, 2001). Many of the species most vulnerable to the problems of floatable debris are endangered or threatened by extinction.

Trash and plastic pellets in waterways causes other significant water quality problems. Small and large floatables can inhibit the growth of aquatic vegetation, decreasing spawning areas and habitats for fish and other living organisms. With the exception of large items, settleables are not always obvious to the eye. This includes plastic pellets, glass, cigarette butts, rubber, construction debris, and more. Settleables can be a problem for bottom feeders and can contribute to sediment contamination.

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[1] According to the National Oceanic and Atmospheric Administration (NOAA) Marine Debris Program, debris is defined as "any persistent solid material that is manufactured or processed and directly or indirectly, intentionally or unintentionally, disposed of or abandoned into the marine environment" (NOAA 2010). In this TMDL, trash does not include naturally occurring vegetation waste. Plastic pellets, also known as plastic resin pellets, are small, round pellets that are the raw form of plastic. These pellets are melted down to form plastic products.

Persistent elements such as plastics, synthetic rubber and synthetic cloth tend to be more harmful than degradable elements such as paper or organic waste. Glass and metal are less persistent, even though they are not biodegradable, because wave action and rusting can cause them to break into smaller pieces that are less sharp and harmful. Natural rubber and cloth can degrade but not as quickly as paper (U.S. EPA, 2002).

Debris in water bodies can threaten the health of people who use them for wading or swimming. Of particular concern are the bacteria and viruses associated with diapers, medical waste (e.g., used hypodermic needles and pipettes), and human or pet waste. Additionally, beachgoers can cut themselves on glass and metal left on the beach. Such injuries can then expose a person's bloodstream to microbes in the stream's water that may cause illness. Also, some debris, such as containers or tires, can pond water and support mosquito production and associated risks of diseases such as encephalitis and the West Nile virus.

Marine debris also endangers the safety and livelihood of fishermen and recreational boaters. Nets and monofilament fishing line can obstruct propellers and plastic sheeting and bags can block cooling intakes.

Most of the effects listed above are related to the health of marine life and people. However, marine debris is also a nuisance. Debris is not aesthetically pleasing to the eye, and can also affect tourism if people do not want to spend time at a beach filled with trash and plastic pellets.

In conclusion, debris in Santa Monica Bay can adversely affect humans, fish, and wildlife. Not all water quality effects of debris are equal in severity or duration. The water quality effects of debris depend on individual items and their buoyancy, degradability, size, potential health hazard, and potential hazards to fish and wildlife. The prevention and removal of trash and plastic pellets in the Santa Monica Bay and their possible source areas will ultimately lead to improved water quality and protection of aquatic life and habitat, expansion of opportunities for recreation, enhancement of public interest in Santa Monica Bay, and public participation in restoration activities, and propagation of the vision of the watershed as a whole and enhancement of the quality of life of those who use the Bay.

F. Debris Impairments of Santa Monica Bay

F.1 Site Inspections

According to the 1998, 2002, and 2006 303(d) lists, debris is impairing beneficial uses in the Santa Monica Bay. On October 16, 2008 and August 10, 2009, Regional Board staff conducted site visits along the beaches in the southern and northern parts of the Santa Monica Bay, respectively, to document the trash problem. The Rapid Trash Assessment method was used to measure and document trash at sites in Redondo Beach, Hermosa Beach, Manhattan Beach, Dockweiler Beach, Venice Beach, Santa Monica Beach, Will Rogers State Beach, Topanga County Beach, Dan Blocker County Beach, Paradise Cove, and Zuma County Beach.

During the site inspection, trash was found at all beaches along the Santa Monica Bay. Common items found on every beach included: plastic bags, candy wrappers, cigarette butts, styrofoam, beverage containers, straws, and paper.

Areas along the beaches north of Santa Monica Beach had much more trash beside Pacific Coast Highway (PCH) and other roads. Many pocket areas were observed with no gutter or other mechanism that would catch the trash from the roadway, through the parking lots, and to the beach. Most of the trash on the roadside consisted of plastic bags, plastic and paper wrappers, and cigarette butts. Along a 100-foot stretch of PCH in Zuma Beach, 52 plastic wrappers, over 100 cigarette butts, and over 60 pieces of paper trash were counted. There were no trash cans observed in this area.

The south bay beaches (south of Santa Monica Beach) are located in more urban areas, and did not have as much trash on the roadside. Since these areas are equipped with catch basins and attached to the municipal separate storm sewer system (MS4), trash does not tend to remain on the roadside. Although there was not much trash observed along the roads, there was trash observed on all south bay beaches.

In general, there was more trash at the beaches with more visitation, such as Santa Monica by the pier, and Venice Beach by the boardwalk. Among the trash found in a 100-foot transect of Santa Monica Beach, there were 43 cigarette butts, 19 pieces of styrofoam, 18 pieces of plastic, and one diaper. There was also a considerable amount of trash found floating in the surf zone near the outfall at Dockweiler Beach, and on the beach itself.

F.2 Other Studies

Data provided by Heal the Bay from the Coastal Cleanup Day in 2009 shows the significant amount of trash that is present on coastal beaches. Volunteers collected 2,750 pounds of trash from Dockweiler State Beach, while 848 pounds were collected at Santa Monica Beach, and approximately 650 pounds at Will Rogers State Beach. At the south bay beaches, approximately 550 pounds were collected at Redondo Beach, 300 pounds at Manhattan Beach, 193 pounds at Torrance Beach, and 160 pounds at Hermosa Beach.

According to Heal the Bay, a majority of marine debris is comprised of plastic material. An estimated 60 to 80 percent of all marine debris (and 90 percent of floating debris) is plastic (Heal the Bay, 2007).

Several studies have investigated the presence of plastics in the waters off of southern California. Plastic pellets, polystyrene, hard plastic fragments, thin films, and line have all been documented in the Santa Monica Bay. A study conducted by Algalita Marine Research Foundation found that plastics were present not only at surface levels, but also in mid-water depths, and at the bottom of the Santa Monica Bay (Gwen L. Lattin et al., 2001).

Two separate studies conducted by UCLA students in 2010 quantitatively and qualitatively examined marine debris distribution on the beaches along the Santa Monica Bay. One of the studies evaluated debris among four Los Angeles County Beaches: Malibu-Surfrider Beach, Venice Beach, Dockweiler State Beach, and Redondo Beach. The other study looked at debris at Topanga Beach and Topanga Canyon Creek. Both studies found that plastics were

present in abundance on all beaches. Many plastic pieces were degraded, suggesting that they had originated in upstream waterways for a significant amount of time before accumulating on beaches. In addition to plastic, styrofoam was prevalent in the mouth of Topanga Canyon Creek and on Topanga Beach. Furthermore, the original use of most debris items found on beaches was associated with food and beverages.

The Ocean Conservancy uses annual data collected during International Coastal Cleanup (ICC), and the National Marine Debris Monitoring Program (NMDMP) to evaluate the sources of marine debris. ICC data collected over several years has indicated that over 60% of debris collected from beaches on Coastal Cleanup Day in the United States is comprised of plastic materials. The primary items from land based sources on the Pacific Coast included food wrappers, beverage containers, cigarettes, and smoking-related materials. The primary items of ocean-related debris included fishing nets and gear. The Ocean Conservancy uses the ICC data to assess the sources of the debris. Data collected during the 2004 California Coastal Cleanup Day revealed the following sources (by number of pieces): shoreline and recreational activities - 48%; Smoking-related activities - 44.2%; Ocean waterway activities - 4.5% (Gordon, 2006).

While there are numerous studies documenting visible and identifiable plastic objects, another study conducted by Algalita Marine Research Foundation and Southern California Coastal Water Research Project (SCCWRP) focused on miniscule plastic fragments, and showed that these fragments of less than 5mm in size have a mass that is 30% of the mass of the associated zooplankton in the Northern Pacific Central Gyre.

A more localized study conducted in the summer of 1998 by SCCWRP examined the composition and distribution of beach debris on Orange County beaches. The study found over 105 million pre-production plastic pellets, weighing more than 4,700 pounds.

II. Numeric Target

The numeric target is derived from the narrative water quality objectives in the Basin Plan for the Los Angeles Region and the California Ocean Plan, including:

"Floating Material"

> *"Waters shall not contain floating materials, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses";*

"Solid, suspended, or settleable materials"

> *"Waters shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses."*

"Floating particulates"

> *"Floating particulates and grease and oil shall not be visible."*

A. Numeric Target for Trash

The numeric target for the Santa Monica Bay Debris TMDL is zero trash in Santa Monica Bay. For point sources, zero trash is defined as no trash discharged into waterbodies within the Santa Monica Bay Watershed and into Santa Monica Bay or on the shoreline of Santa Monica Bay. For nonpoint sources, zero trash is defined as no trash on the shoreline or beaches, or in harbors adjacent to Santa Monica Bay, immediately following each assessment and collection event consistent with an established Minimum Frequency of Assessment and Collection Program (MFAC Program). Regional Board staff has not found information to justify any value other than zero that would fully support the designated beneficial uses. Further, court rulings have found that a numeric target of zero trash is legally valid. The numeric target was used to calculate the Load Allocations for nonpoint sources and Waste Load Allocations for point sources, as described in the following sections of this Staff Report.

B. Numeric Target for Plastics

The numeric target for plastic pellets in the Santa Monica Bay Debris TMDL is zero plastic pellets in Santa Monica Bay. For point source dischargers of plastic pellets, zero plastic pellets is defined as no plastic pellets discharged from the premises of industrial facilities that import, manufacture, process, transport, store, recycle or otherwise handle plastic pellets. Similar to trash, this numeric target supports the designated beneficial uses, as stated above.

III. Source Analysis

Contaminants that enter the Bay may originate on land, in the air, or at sea outside of the Bay itself. Although the sources of pollutants are numerous and disparate, they are ultimately the product of all the people who live, work, and play in the region. Countless human activities directly influence the amount and types of pollutants that enter the Bay. Along the West Coast, land-based debris comprises over half of the debris observed in the marine environment followed by undetermined sources of debris, while ocean-based debris comprises only approximately one-tenth of the debris observed in the marine environment (Sheavly, 2007).

Trash Sources

The major source of trash in the Santa Monica Bay results from litter, which is intentionally or accidentally discarded by people and ends up in the Santa Monica Bay. Over 4,000 tons of trash is collected from Bay beaches annually and a 1994 survey found that one-quarter of the ocean bottom surveyed contained man-made materials (Santa Monica Bay Restoration Plan). The potential trash sources can be categorized as point sources and nonpoint sources depending on the transport mechanisms, which include:

1. Storm drains: trash that is deposited throughout the watershed is carried to the various beaches and Santa Monica Bay during and after rainstorms through storm drains. This is a point source.

2. Marine vessels/ships: trash can be deposited into the Santa Monica Bay directly from marine vessels and ships. This is a nonpoint source.

3. Wind/wave action: trash can be blown or washed into the Santa Monica Bay directly. This is a nonpoint source.

4. Direct disposal: direct dumping or littering into the Santa Monica Bay. This is a nonpoint source.

According to the characteristics of the land uses which include high and low density residential areas, open space and parks, both point and nonpoint sources contribute trash to the Santa Monica Bay.

Plastic Pellet Sources

Approximately 60 billion pounds of plastic pellets are manufactured annually in the United States, where they are frequently discharged to waterways during the transport, packaging, and processing of plastics (Heal the Bay, 2007). Like trash, the plastic pellets can reach Santa Monica Bay via storm drains, wind, or direct spills. Plastic pellets are transported through ships, trucks, and trains from plastic manufacturers to plastic industries. Once discharged, the pellets are easily blown by wind or carried by stormwater through the storm drain system and to the beaches and water of the Santa Monica Bay. Since the plastic pellets are very small (less than 5 millimeters), they will not be captured by most trash capture devices. Studies in New York, Boston, and Houston showed that combined sewer overflows and storm drains were sources of pellets in the aquatic environment (U.S. EPA, 1992).

A. Point Sources

There are several point sources that contribute to Santa Monica Bay and its watershed. Municipal storm drains and discharges from industrial facilities that manufacture, transport or otherwise handle plastic pellets will be the major focus of point sources in this Debris TMDL.

Land Based Point Sources of Trash

Trash conveyed by urban runoff and storm water through storm drains to the Santa Monica Bay is evidenced by trash accumulation at the base of storm drains discharging to the beaches and catch basins, which collect runoff from surrounding lands.

Urban and storm water runoff, carried to the Bay through the region's massive storm drain systems and streams, is a serious, year-round concern. Each year, an average of 30 billion gallons of storm water and urban runoff are discharged through more than 200 outlets. Even in dry weather, ten to 25 million gallons of water flow through storm drains into Santa Monica Bay every day. Table 4 and Figure 6 show the major storm drains that empty into Santa Monica Bay.

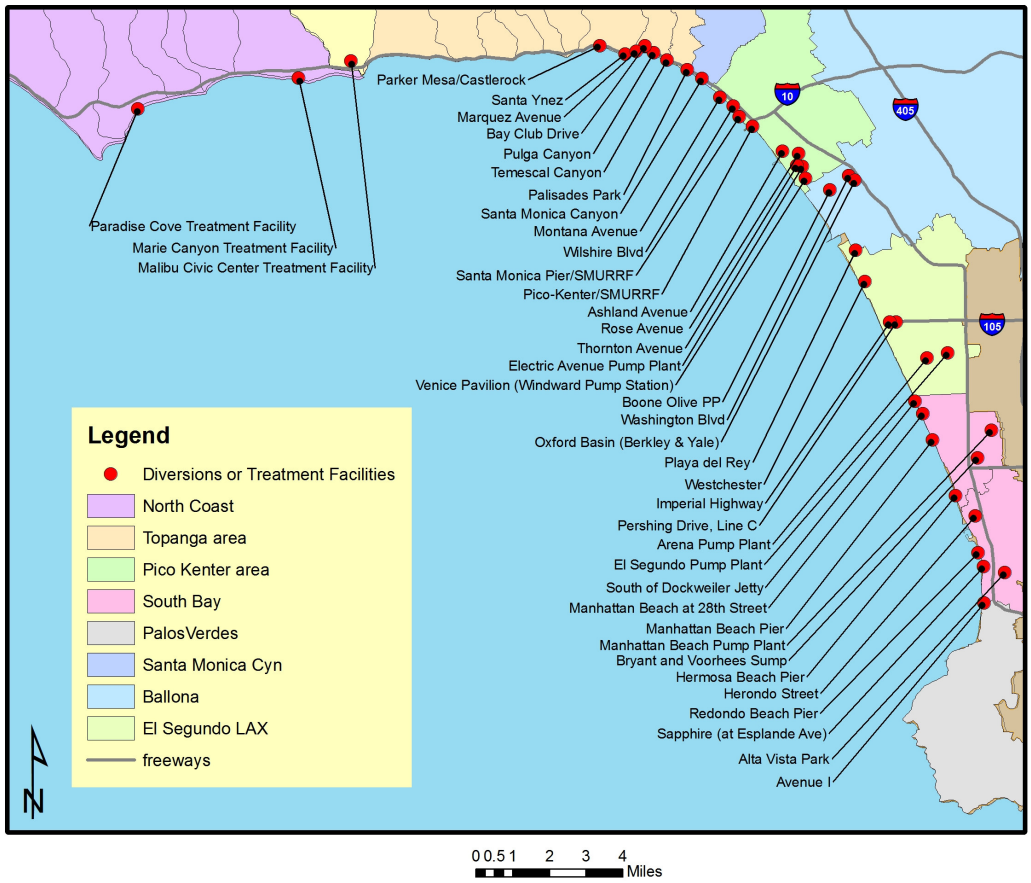
Runoff flows over rooftops, parking lots, roadways and freeways, sidewalks, commercial areas, construction sites, industrial facilities, and other impervious surfaces, picking up trash and transporting it through open channels and underground pipes directly to the Bay.

Because the region's 5,000-mile network of storm drains was built to convey flood waters to the ocean as quickly as possible, all wet-weather flows and most dry-weathers flow bypass wastewater treatment facilities and discharge directly to the Bay. However, some facilities treat runoff on-site, such as those at Malibu Lagoon, Marie Canyon, Paradise Cove and the Santa Monica Pier.

Table 4. Major creeks, open channel, and storm drains in Santa Monica Bay beach cities and Los Angeles County.

Low Flow Diversion	Subwatershed
Boone Olive PP	Ballona
Washington Blvd	Ballona
Oxford Basin (Berkley at Yale)	Ballona
Playa del Rey	El Segundo-LAX
Westchester	El Segundo-LAX
Pershing Drive, Line C	El Segundo-LAX
Arena Pump Plant	El Segundo-LAX
El Segundo Pump Plant	El Segundo-LAX
Imperial Highway	El Segundo-LAX
Malibu Civic Center Treatment Facility	Malibu
Paradise Cove Treatment Facility	North Coast
Marie Canyon Treatment facility	North Coast
Avenue I	Palos Verdes
Alta Vista Park	Palos Verdes
Rose Avenue (phase 2)	Pico Kenter
Ashland Avenue (phase 2)	Pico Kenter
Electric Avenue Pump Plant	Pico Kenter
Thornton Avenue	Pico Kenter
Venice Pavilion (Windward Ave Pump Station)	Pico Kenter
Montana Avenue	Pico Kenter
Wilshire Avenue	Pico Kenter
Santa Monica Pier	Pico Kenter
Pico-Kenter	Pico Kenter
Santa Monica Canyon	Santa Monica Cyn
Manhattan Beach Pump Plant	South Bay
Manhattan Beach at 28th Street (The Strand)	South Bay
Herondo Street	South Bay
South of Dockweiler Jetty	South Bay
Manhattan Beach Pier	South Bay
Hermosa Beach Pier	South Bay
Redondo Beach Pier	South Bay
Sapphire (at Esplande Ave)	South Bay
Bryant and Voorhees Sump	South Bay
Parker Mesa/Castlerock	Topanga
Santa Ynez	Topanga
Pulga Canyon	Topanga
Palisades Park	Topanga
Bay Club Drive	Topanga
Temescal Canyon	Topanga
Marquez Avenue	Topanga

Figure 6. Low flow diversions and treatment facilities in the Santa Monica Bay Watershed Management Area



Extensive research has not been done on trash generation or the precise relationship between rainfall and its deposition in waterways. However, it has been found that the amount of gross pollutants entering the stormwater system is rainfall dependent but does not necessarily depend on the source (Walker and Wong, December 1999). The amount of trash which enters the stormwater system depends on the energy available to re-mobilize and transport deposited gross pollutants on street surfaces rather than on the amount of available gross pollutants deposited on street surfaces. Where gross pollutants exist, a clear relationship between the gross pollutant load in the stormwater system and the magnitude of the storm event has been established. The limiting mechanism affecting the transport of gross pollutants, in the majority of cases, appears to be re-mobilization and transport processes (i.e., stormwater rates and velocities).

Several studies conclude that urban runoff is the dominant source of trash. The large amount of trash conveyed by urban storm water to the Los Angeles River is evidenced by the trash that accumulates at the base of storm drains. The amount and type of trash that is washed into the storm drain system appears to be a function of the surrounding land use.

A number of studies (Walker and Wong, 1999, Allison, 1995), have shown that commercial land-use catchments generate more pollutants than residential land-use catchments, and as much as three times the amount generated from light industrial land-use catchments. It is generally accepted that commercial land uses tend to contribute larger loads of gross pollutants per area compared to residential and mixed land-use areas. This is in spite of the typical daily street sweeping in the commercial sub-catchment compared to the typical frequency of once every two weeks in residential and mixed land use areas.

Based on reports and research on other watersheds, the amount and type of trash washed into the storm drain system appears to be a function of the surrounding land use. The City of Long Beach has recorded trash quantity collected at the mouth of the Los Angeles River; the result suggested that the total trash amount is somewhat linearly correlated with the precipitation (see Table 5).

Table 5. Storm Debris Collection Summary for Long Beach: (Signal Hill, 2006).

Year	Trash (Tons)	Precipitation (inches)
95-96	4162	12.44
96-97	3993	12.4
97-98	9290	31.01
98-99	3091	9.09
99-00	3844	11.57
00-01	4437	17.94
01-02	1858	4.42
02-03	4630	16.42
03-04	2636	9.25
04-05	12225	37.25
05-06	1059	13.19

The City of Calabasas conducted a study for Continuous Deflective Separation (CDS) units installed in December of 1998 for runoff from Calabasas Park Hills to Las Virgenes Creek. It is assumed that this CDS unit prevented all trash from passing through. The calculated area drained by this CDS Unit is approximately 12.8 square miles. The urbanized area estimated by Regional Board staff is 0.10 square miles. The result of this clean-out, which represents approximately half of the 1998-1999 rainy season, was 2,000 gallons of sludgy water and a 64-gallon bag about two-third full of plastic food wrappers. It is assumed that part of the trash accumulated in the CDS unit over roughly half of the rainy season had decomposed in the unit due to the absence of paper products. Given the CDS unit was cleaned out after slightly more than nine months of use, it was assumed that this 0.10 square mile urbanized area produced a volume of 64 gallons of trash over one year.

To estimate trash generation rates, studies from other watersheds were analyzed by Regional Board staff. The County of Los Angeles conducted a trash baseline study in 2003-2004 in the Los Angeles River Watershed and the Ballona Creek Watershed. The study examined different land uses, such as: high-density single-family residential, low-density single-family residential, commercial, industrial, and open space/parks. The County of Los Angeles installed 250 catch basin inserts in the Los Angeles River Watershed, and 250 catch basin inserts in the Ballona Creek Watershed, with a minimum of 10 sites per land use having at least 5 catch basins per site. They also installed five Continuous Deflective Separator units. The results of the study indicated an average of 5,741.34 pounds per square mile per year

generated from the Los Angeles River Watershed, and 3,663.55 pounds per square mile per year from the Ballona Creek Watershed.

Land Based Point Sources of Plastic Pellets

Industries that manufacture, store, process, and otherwise handle plastic pellets as raw material are sources of pellets in the environment. Although the plastic pellets ultimately make their way to the beaches of Santa Monica Bay through storm drain systems, they originate on the premises of the plastic industries and discharges from these facilities are regulated through separate regulatory mechanisms. When industries release plastic pellets onto the ground and adjacent areas of the site, they are responsible for ensuring that the plastic pellets are not transported off-site via runoff and stormwater.

Marine Based Point Sources of Plastic Pellets

Researchers have suggested possible sources of plastic pellets in the marine environment, which include direct discharges and improper waste water disposal by the plastics industry, spillage from ships during loading, transport, and unloading, and improper use of pellets (i.e., for bearings to facilitate movement of cargo boxes and heavy objects). Other studies showed spillage at loading and shipping docks as a source of plastic pellets to the marine environment (U.S. EPA, 1992).

B. Nonpoint Sources

Nonpoint source pollution is commonly caused by a wide range of activities including urban development, agriculture, and recreation. The trash deposited in the Santa Monica Bay resulting from nonpoint sources is a function of transport mechanisms including wind, wave action, stormwater, and visitation, as they relate to open space, beaches, state parks, harbors and marinas, boating, and roadways.

There are limited studies, particularly to define the relationship between the strength of winds and movement of trash from a land surface to a waterbody. Lighter trash with a sufficient surface area to sail with the wind, such as plastic bags and pellets, beverage containers, paper or plastic convenient food containers are easily lifted and carried to the Santa Monica Bay. Also, as described in the point source section, stormwater carries trash from shore areas and beaches to waterbodies. Transportation of pollutants from one location to another is determined by the energy of wind, wave action, stormwater, and visitation.

Land Based Nonpoint Sources of Trash

In consideration of transport mechanisms, existing trash in the environment near the Santa Monica Bay is a fundamental cause of nonpoint sources trash loading. Based on observation, land use can be generally divided into categories of low density single-family residential, open space/parks, and beach areas. Residents may accidentally discard trash to the backyard, grass, or roads along the beach, which initiates the journey of trash to the Santa Monica Bay via wind or stormwater. Different uses of the open space may be responsible for different degrees of trash impairment. For example, areas with picnic tables closer to the bay

have a higher likelihood of having more trash on the ground near the water than in parking lots. Visitation rates also appear to be correlated with the amount of trash from nonpoint sources.

Large areas such as beaches and parks are especially prone to transport mechanisms such as wind and wave action. Pier fishermen and beach visitors generate trash that, if not properly disposed of, can be blown or washed directly into the Bay. In addition, trash can be blown or taken out of trash receptacles by birds if they are not covered.

Review of beach clean up data provided by Heal the Bay shows that the three most common trash types found on beaches surrounding the Santa Monica Bay are: plastic, styrofoam, and cigarette butts. Site visits support this data, and suggest that a large portion of the trash found on beaches is directly deposited by beach visitors. The areas that have high visitation tend to have more trash. Venice Beach by the board walk and Santa Monica Beach by the Santa Monica Pier are two examples.

Harbors and the marinas located within them are large areas that attract recreational and commercial boaters. Wind and stormwater can sweep any nearby trash into the harbor waters, if there is trash present in adjacent areas. Table 6 lists the marinas and yacht clubs in the Santa Monica Bay.

Table 6. Marinas and Yacht Clubs in Santa Monica Bay

Marinas, Anchorages, and Yacht Clubs Managed by County of Los Angeles Department of Beaches and Harbors
Anchorage 47
Bar Harbor Marina
Bay Club Marina
Boat Yard
Burton Chace Park Transient Boat Docks
California Yacht Club
Del Rey Yacht Club
Dolphin Marina
Esprit (formerly Deauville Marina)
Holiday Harbor Marina
Marina City Club
Marina del Rey Marina
Marina Harbor Anchorage
Mariner's Bay Anchorage
Neptune Marina
Pier 44 Marina
Public Boat Launch Ramp
Tahiti Marina
Villa del Mar Marina
Windward yacht Repair
Marina Venice Yacht Club
Pacific Mariner's Yacht Club
Santa Monica Windjammers Yacht Club
South Coast Corinthian Yacht Club
Marina del Rey Sportfishing
Marina Fuels and Service
Marinas Managed by City of Redondo Beach Harbor Department
King Harbor Marina
California Yacht Marina
Portofino Marina
Redondo Beach Marina
King Harbor Yacht Club

Currently, there is a Statewide Marina General Permit under development by the State Water Resources Control Board, in which all coastal marinas, 10-slips or more will be required to have a marina permit that necessitates complete and regular testing of a marina basin's water. There will be a trash component to the Permit, and the regulation of land based and marine based nonpoint sources of trash will be consistent with the final requirements of the Marina Permit.

Marine Based Nonpoint Sources of Trash

Commercial and recreational fishing boats, sailboats, cruise ships, and import/export container ships are also nonpoint sources. In addition to trash being blown overboard, the passengers on these vessels may be depositing trash into the Bay. According to a study conducted as part of the Southern California Bight Pilot Project, entitled "Distribution of Anthropogenic and Natural Debris on the Mainland Shelf to the Southern California Bight," anthropogenic debris was most commonly found in the urbanized regions, on the outer shelf, and in areas near publicly owned treatment works (POTWs). Fishing gear was the most common type of anthropogenic debris in the urban and outer shelf zone, whereas glass bottles and plastic were most common in POTW areas. Glass bottles and cans are too large to pass through the screens covering POTW outfall pipes, so it was concluded that they were not discharged from this source. However, these outfall pipes are essentially artificial reefs, and are popular fishing spots for recreational anglers. As a result, the study suggested that marine vessels and fishing activities are a likely source of anthropogenic debris in the Santa Monica Bay (Moore, Shelly L. and Allen, M. James, 1994).

Land Based Nonpoint Sources of Plastic Pellets

Although plastic industries are the primary point source for plastic pellets, it is likely that any spills that happen during transport, transfer, or handling may release loose plastic pellets to the MS4 and eventually to the beach and the Santa Monica Bay. Any such spills will be addressed by the previously mentioned land based point source of plastic pellets or the MS4 Permittees.

IV. Linkage Analysis

This TMDL is based on numeric targets derived from narrative water quality objectives for floating materials and particulates and solid, suspended, or settleable materials. The narrative objectives prescribe that waters shall not contain these materials in concentrations that cause nuisance or adversely affect beneficial uses. Based on these targets, staff finds the capacity of the Santa Monica Bay to accumulate trash is zero. Similarly, the Santa Monica Bay should accumulate no plastic pellets.

V. Waste Load and Load Allocations

Waste Load and Load Allocations for Trash

Both point sources and nonpoint sources are identified as sources of trash in the Santa Monica Bay. For point sources, the strategy for attaining water quality standards focuses on assigning Waste Load Allocations (WLAs) to the Permittees of the Los Angeles County Municipal Separate Storm Sewer System (MS4) Permit, and the Ventura County MS4 Permit (hereinafter referred to as Responsible Jurisdictions). The WLAs will be implemented through permit requirements. For nonpoint sources, the strategy for attaining water quality standards focuses on assigning Load Allocations (LAs) to municipalities, and agencies having jurisdiction over the beaches, harbors, parks and open space, and the vicinities surrounding these beaches and harbors. Final WLAs and LAs are zero trash. The LAs will be implemented through regulatory mechanisms that implement the State Board's 2004 Nonpoint Source Policy, which may include but are not limited to conditional waivers, waste discharge requirements, or prohibitions.

WLAs and LAs are based on a phased reduction from the Baseline Waste Load and Load Allocation, estimated as the current discharge, over an eight-year period for point source trash reduction compliance, and a five-year period for nonpoint source trash reduction compliance by using a program of minimum frequency of trash assessment and collection (MFAC) program discussed below. Responsible agencies and jurisdictions assigned a WLA may achieve WLAs through the use of full capture systems, partial capture systems, institutional controls, nonstructural BMPs, or any other lawful methods. Responsible agencies and jurisdictions assigned a LA may achieve LAs through implementation of a Regional Board Executive Officer approved MFAC program in conjunction with BMPs.

Waste Load Allocations for trash are assigned to the California Department of Transportation (Caltrans, permittee for Statewide National Pollutant Discharge Elimination System (NPDES) Storm Water Permit, No. 99-06-DWQ); the Los Angeles County Flood Control District (principal permittee for Los Angeles County Municipal Separate Storm Sewer System (MS4) NPDES Permit, No. CAS004001), and Los Angeles County and the Cities of Agoura Hills, Calabasas, Culver City, El Segundo, Hermosa Beach, Los Angeles, Malibu, Manhattan Beach, Palos Verdes Estates, Rancho Palos Verdes, Redondo Beach, Rolling Hills, Rolling Hills Estates, Santa Monica, Torrance, and Westlake Village (co-permittees within the Santa Monica Bay WMA under the Los Angeles County MS4 NPDES Permit); and the Ventura County Watershed Protection District (principal permittee for Ventura County MS4 NPDES Permit, No. CAS004002), County of Ventura, and City of Thousand Oaks (co-permittees within the Santa Monica Bay WMA under the Ventura County MS4 NPDES Permit).

Responsible agencies and jurisdictions covered by the Ballona Creek Watershed Trash TMDL including Caltrans, County of Los Angeles, and the Cities of Beverly Hills, Culver City, Inglewood, Los Angeles, Santa Monica, and West Hollywood, and responsible agencies and jurisdictions identified in the Malibu Creek Trash TMDL including Caltrans, Los Angeles County, Ventura County, Ventura County Watershed Protection District, and the Cities of Agoura Hills, Calabasas, Hidden Hills, Malibu, Thousand Oaks, and Westlake Village are also responsible for point source discharges of trash into the Santa Monica Bay via open channels and storm drains. The WLA applicable to MS4 Permittees that is established herein, and the associated requirements for these responsible agencies and jurisdictions shall be addressed through the Ballona Creek Trash TMDL (Regional Board Resolution No. R01-014 and any

amendments thereto) and the Malibu Creek Trash TMDL (Regional Board Resolution No. R08-007 and any amendments thereto).

The WLA may be assigned to additional responsible jurisdictions discharging urban runoff and stormwater in the future under Phase II of the National Stormwater Permitting Program, or other applicable regulatory programs.

On January 16, 2008, Los Angeles Regional Board staff conducted a site inspection in response to the City of Simi Valley's request brought during the CEQA Scoping meeting for the Malibu Creek Watershed Trash TMDL. The City of Simi Valley requested that Regional Board staff evaluate the responsibilities of the City as a responsible jurisdiction. Based on geographical information system (GIS) data, Simi Valley has approximately 118 acres of property within the upper Las Virgenes Creek Subwatershed. According to the 1991 land use data published by the Southern California Association of Governments (SCAG), all of the subject land area is undeveloped open space. Access to the area is limited to two fire roads, and is restricted because the entrance is within gated private properties. During the inspection, there was no trash found along the road and within the range of visibility. Given these findings, the Regional Board staff did not include Simi Valley on the list of Responsible Jurisdictions for the Malibu Creek Watershed Trash TMDL, since the responsibility of Simi Valley is minimal, if any. The area within the City of Simi Valley that is part of the watershed addressed by this TMDL continues to have the same consideration. Therefore, the City of Simi Valley is not included as a responsible jurisdiction in this Santa Monica Bay Debris TMDL. However, if there are any changes in land use in the portion of the City within this TMDL, the Los Angeles Regional Board reserves the right to reconsider the City's responsibility under this TMDL, and to impose TMDL requirements on Simi Valley to ensure that water quality is protected.

Load Allocations are assigned to jurisdictions that own and/or manage beaches and harbors along Santa Monica Bay, which include California Department of Parks and Recreation, County of Los Angeles Department of Beaches and Harbors, Cities of Hermosa Beach, Los Angeles, Santa Monica, and Redondo Beach.

The National Park Service, California Department of Parks and Recreation, County of Los Angeles, County of Ventura, and State Lands Commission, which have jurisdiction over non-beach open space and/or parks are assigned LAs. The LA may be assigned to additional responsible jurisdictions and/or agencies in the future under appropriate regulatory programs.

Waste Load Allocations for Plastic Pellets

The WLA for plastic pellets is zero discharge from the premises of industrial facilities that import, manufacture, process, transport, store, recycle or otherwise handle plastic pellets. The WLA is consistent with Cal. Water Code § 13367 and 40 CFR 122.26(b)(12).

For point sources of plastic pellets, the strategy for attaining water quality standards focuses on assigning WLAs to industries engaged in the manufacture, transport or handling of plastic pellets. The WLAs will be implemented through permit requirements.

WLAs for plastic pellets are assigned to permittees of the Industrial Storm Water General Permit (Order No. 97-03-DWQ, and NPDES Permit No. CAS 000001) within the Santa Monica Bay WMA. The Standard Industry Classification (SIC) codes associated with industrial activities involving plastic pellets may include, but are not limited to, 282X, 305X, 308X, 39XX, 25XX, 3261, 3357, 373X, and 2893. Additionally, industrial facilities with the term "plastic" in the facility or operator name, regardless of the SIC code, may be subject to the WLA for plastic pellets. Other industrial permittees within the Santa Monica Bay WMA that fall within the above categories, but are regulated through other general permits and/or individual industrial storm water permits are also required to comply with the WLA for plastic pellets.

A. Waste Load Allocations

A.1 Baseline Waste Load Allocation for Trash for MS4 Responsible Jurisdictions

The Baseline Waste Load Allocation for any single permittee is the sum of the products of each land use area multiplied by the Waste Load Allocation for the land use area, as shown below:

$$WLA = \sum for\ each\ \ city\left(area\ by\ land\ uses \bullet allocations\ \ for\ this\ land\ use\right)$$

Southern California Association of Governments (SCAG) classified twelve types of land uses for every city and unincorporated area in the watershed. The land use categories are: (1) high density residential, (2) low density residential, (3) commercial and services, (4) industrial, (5) public facilities, (6) educational institutions, (7) military installations, (8) transportation, (9) mixed urban, (10) open space and recreation, (11) agriculture, and (12) water.

Data collected during implementation of the Trash Monitoring and Reporting Plan can be used to establish specific site trash generation rates for various or all land uses. The land use categories relevant to the Santa Monica Bay are:

- High density residential,
- Low density residential,
- Commercial,
- Industrial,
- Military,
- Public Facilities,
- Transportation,
- Agriculture,
- Educational institutions, and
- Open space and recreation.

Transportation land use under Caltrans' jurisdiction will be covered under Caltrans' permit. Caltrans will be required to submit a monitoring plan for that land use, and will be assigned a Waste Load Allocation. Major boulevards that are currently under Caltrans' jurisdiction, but are affected by trash generated on municipal sites will be addressed by the cities concerned.

All different land uses may be assumed to have the same litter generation rate unless data is collected separately for specific land uses.

Responsible jurisdictions may provide acreage of above mentioned land uses within their jurisdiction in order to revise their contributions from their assigned Baseline Waste Load Allocations. The Baseline Waste Load Allocations for responsible jurisdictions are presented in Table 9. For responsible jurisdictions that are only partially located in the watershed, the square mileage indicated is for the portion in the watershed only. The values shown are uncompressed volume in gallons. A more detailed breakdown along land uses is provided in Appendix II.

A.1.1 Baseline WLAs for Trash for MS4 Responsible Jurisdictions North and West of the Malibu Creek Watershed

The Santa Monica Bay Debris TMDL includes some jurisdictions that have been identified as responsible jurisdictions under the existing Malibu Creek Trash TMDL. The Malibu Creek Trash TMDL only addresses limited reaches in the Malibu Creek Watershed. However, the remaining part of the Malibu Creek Watershed is to be incorporated into this TMDL. To be consistent, responsible jurisdictions in the Malibu Creek Watershed and areas at the west end of the Santa Monica Bay Watershed will be assigned the same Waste Load Allocation that was established in the Malibu Creek Trash TMDL. The Waste Load Allocation is 640 gallons of trash per square mile per year.

As discussed in the Problem Statement chapter of this report, the northern portion of the Santa Monica Bay Watershed is characteristically different from the southern portion of the watershed. The Malibu Creek Subwatershed and the areas north and west of the Malibu Creek Subwatershed are typically not as developed, and have more open space than the areas to the south and east. As the City of Calabasas is located in the Malibu Creek Subwatershed, which is in the northern part of the Santa Monica Bay Watershed and is characteristically similar to other areas north and west of the Malibu Creek Subwatershed, Regional Board staff concludes that it is appropriate for the jurisdictions north and west of the Malibu Creek Subwatershed to have a Baseline Waste Load Allocation based on the trash generation rate derived from the City of Calabasas study.

A.1.2 Baseline WLAs for Trash for MS4 Responsible Jurisdictions South and East of the Malibu Creek Watershed

The area of the Santa Monica Bay Watershed to the south and east of the Malibu Creek Subwatershed is highly developed and urbanized. In 2003 and 2004, the County of Los Angeles documented the trash generation rates in the Ballona Creek Watershed to fulfill the requirements of the Ballona Creek Trash TMDL. The data collected from the Ballona Creek Watershed, which was from multiple land uses, is appropriate as the Baseline Waste Load Allocation. The Waste Load Allocation from this study is 807 gallons per square mile per year.

Municipal stormwater permittees may implement their TMRPs to obtain site specific trash generation rates during the first two years of the implementation period and, if approved by the Regional Board's Executive Officer, ultimately use these data to define the trash Baseline Waste Load Allocations. The TMRP will derive a representative trash generation rate from various land uses of responsible agencies and jurisdictions discharging stormwater to the Santa Monica Bay. This TMRP shall include, but is not limited to, assessment and quantification of trash collected from responsible jurisdiction land areas where urban runoff and stormwater discharges to the MS4, which leads to the beaches and the Santa Monica Bay. The monitoring plan shall provide details of the frequency, location, and reporting of trash monitoring. Responsible jurisdictions shall propose a metric (e.g., weight, volume, pieces of trash) to measure the amount of trash accumulated in the MS4 from the surrounding land areas. The derived trash generation rate may be used to refine the Waste Load Allocation when the TMDL is reconsidered.

A.2 Baseline Waste Load Allocations for Caltrans Stormwater Permit

During the 1998/1999 and 1999/2000 rain seasons, a Litter Management Pilot Study (LMPS) was conducted by Caltrans to evaluate the effectiveness of several litter management practices in reducing litter that is discharged from Caltrans storm water conveyance systems. The LMPS employed four field study sites; at each site, the amount of trash produced using different BMPs was measured. The average total loads for each site normalized by the total area of control catchments is presented in Table 7, adapted from the LMPS report:

Table 7. Preliminary weight and volume for freeways by Litter Management Pilot Study (LMPS).

Weight lbs/sq mi/year	Volume cu ft/sq mi/year	Volume gal/sq mi/year
7,479.36	892.64	6,677.39

Subsequently, Caltrans launched a Gross Solid Removal Devices (GSRDs) Pilot Program to study trash removal efficiencies of various systems installed along freeways in 2000. Three preliminary designs for different GSRDs which are the Linear Radial, the Inclined Screen, and the Baffle Box were developed. These GSRDs fulfill the criteria of being certified as Full Capture Systems, to be drained within 72 hours, requiring cleanup once a year, and needing no maintenance throughout the storm season.

The Linear Radial utilizes a casing with louvers to serve as screens or mesh screen. Flows are routed through the louvers and into a vault. The Inclined Screen uses wedge-wire screen with the slotting perpendicular or parallel to the direction of flow. This device is configured with an influent trough to allow solids to settle. The Baffle Box applies a two-chamber concept: the first chamber utilizes an underflow weir to trap floatable solids, and the second chamber uses a bar rack to capture material. All of these designs were certified as Full Capture Systems by the Executive Officer of the Regional Board on October 7, 2004.

Table 8 below summarizes the annual trash loads normalized with the drainage areas at multiple sites for years 2000-2001 and 2001-2002.

Table 8. Average weight and volume for trash for freeways by Caltrans Phase I Gross Solids Removal Devices Pilot Study at Year 2000 through 2002.

Year	Weight lbs/sq mi/year*	Volume cu ft/sq mi/year	Volume gal/sq mi/year
2000-2001	157,240	4,184	31,298.41
2001-2002	146,280	4,760	35,607.18
Average	151,760	4,472	33,452.8

*The trash weight was measured after drip drying.

According to the GSRD phase I study, the baseline WLA for Caltrans is 4,472 $ft^3/mi^2/yr$, or 33,452.8 $gallons/mi^2/yr$. The GSRD study has more recent data, and is applicable to the Santa Monica Bay Watershed based on the land use, population density, and average daily traffic conditions.

A.3 Baseline Waste Load Allocation Assignments for Trash

Table 9 shows the Baseline WLAs for all point source dischargers, in gallons per year, assuming a trash generation rate of 640 $gallons/mi^2/yr$ in the Malibu Creek Subwatershed and areas north and west of the Malibu Creek Subwatershed, or 806.9 $gallons/mi^2/yr$ in areas south and east of the Malibu Creek Watershed. If the MS4 Permittees use their respective TMRPs to derive site specific trash generation rates, the Baseline WLAs will be calculated by multiplying the point source areas by the derived trash generation rates. The Baseline WLA for Caltrans was based on a trash generation rate of 33,452.8 $gallons/mi^2/yr$, as determined by the GSRD study.

Table 9. Baseline Waste Load Allocations for trash, assuming corresponding trash generation rates.

Responsible Parties	Point Source Area ($Mile^2$)	Baseline WLA (gals/year)
Los Angeles County Flood Control District	6.37	5137.8
County of Ventura	1.11	710.1
Caltrans	4.05	135,545.4
Cities of:		
Agoura Hills	1.63	1,044.0
Calabasas	2.59	1656.4
Thousand Oaks	7.25	4,640.4
Westlake Village	4.89	3,130.9
Malibu	9.08	5,809.4
Culver City	0.06	51.9
Los Angeles	31.12	25,112.2
Santa Monica	7.03	5,671.5
El Segundo	3.39	2,732.2
Manhattan Beach	3.10	2,501.4
Hermosa Beach	1.38	1,117.3
Redondo Beach	3.96	3,196.9
Torrance	3.08	2,483.6
Palos Verdes Estates	4.15	3,345.8
Rancho Palos Verdes	8.99	7,254.3
Rolling Hills Estates	0.45	364.7
Rolling Hills	0.64	515.1

B. Load Allocations

Load Allocations (LAs) for nonpoint sources follow phased reduction from Baseline Load Allocations. According to the State's Nonpoint Source Policy, Load Allocations may be addressed by the Statewide General Permits, conditional waivers of WDRs, or individual WDRs among other implementation mechanisms.

Responsible jurisdictions shall monitor the trash quantity deposited in the vicinities of the Santa Monica Bay and its beaches to comply with Baseline Load Allocation. Data collected through the Trash Monitoring and Reporting Plan may define the quantity of trash migrating from land to the Bay.

B.1 Load Allocation for Nonpoint Source Areas Excluding Beaches

The areas adjacent to the Santa Monica Bay, or defined as nonpoint sources, are composed of multiple land uses. There are parking lots, recreational areas, picnic areas, and hiking areas in the open space/park areas under the jurisdictions of Los Angeles County, Ventura County, National Park Service, California Department of Parks and Recreation, and California State Lands Commission. By applying the similar concept that is applied for the Waste Load Allocation calculation, the Load Allocation for any designated nonpoint source area is the sum of the products of each land use subarea multiplied by the Load Allocation for the land use subarea, as shown below:

$$LA = \sum \textit{for each Nonpoint source}\left(\textit{subarea by land uses} \bullet \textit{allocations for this land use}\right)$$

It may be appropriate to assume the same trash generation rate or allocation for different types of land uses.

By applying the study by the City of Calabasas, the trash generation rate from nonpoint sources areas for open space and parks areas is 640 gallons per square mile per year. Table 10 represents the baseline load allocations for nonpoint source areas of parks and open space in the Santa Monica Bay Watershed. Responsible Jurisdictions may propose and implement the Regional Board Executive Officer approved TMRPs to obtain site-specific trash generation rates for the first two years of the implementation period. The data collected including, but not limited to, the details of the frequency, location, and reporting of trash monitoring, as well as a metric (e.g., weight, volume, pieces of trash) to measure the amount of trash in the nonpoint source areas of the Santa Monica Bay may be used to refine the trash Baseline Load Allocations when the TMDL is reconsidered. Data collected shall include the trash accumulated on the open space and park areas, which could possibly be carried directly to Santa Monica Bay by sheetflow, wind or wave action, or human activities.

Table 10. Baseline Load Allocations for nonpoint source areas of parks and open space (excluding beaches), assuming a trash generation rate of 640 (gallons of uncompressed litter).

Responsible Parties	Nonpoint Source Area ($Mile^2$)	Baseline Load Allocation (gals/year)
County of Los Angeles	47.32	30,287.0
Ventura County	8.53	5,459.1
National Park Service	11.72	7,498.1
California Department of Parks and Recreation	19.05	12,190.9
State Lands Commission	1.37	879.8

B.2 Load Allocations for Beaches

The load allocation for beaches is zero trash. Current practices employed by the Los Angeles County Department of Beaches and Harbors (LACDBH) and the City of Santa Monica include daily cleanup on the beaches in their respective jurisdictions. Based on the quantity of trash collected by LACDBH, the daily cleanup has reduced approximately 8.4 million pounds of trash per year from the beaches managed by LACDBH. Additional cleanup schedules or BMPs may be necessary to achieve the load allocation. As such, responsible jurisdictions for beaches will instead be assigned a benchmark.

B.2.1 Benchmark for Beaches

The 55-miles of beaches along Santa Monica Bay, with parking lots, bike paths, and recreational parks, are major nonpoint source areas for trash. According to Los Angeles County Department of Beaches and Harbors staff, current practices include collecting trash and cleaning beaches in their jurisdiction daily in the morning. These practices involve both heavy equipment and manual labor. In the past 20 years, Los Angeles County Department of Beaches and Harbors has collected more than 84,000 tons of debris with the most trash littered after July 4^{th} weekend in 1992 (101 tons). Environmental groups host annual Coastal Cleanup Day activities, in which volunteers help to collect trash and debris along stretches of selected beaches in the Santa Monica Bay. Although LACDBH cleans the beach daily in the morning, visitors continue to litter on the beach throughout the day. As the Coastal Cleanup Day activities were usually conducted after LACDBH's daily cleanup for the rest of the day, the data may represent the trash that is deposited on the beach within a day. In determining the benchmark for beaches in the Santa Monica Bay, Regional Board staff considered the current practices of the Los Angeles County Department of Beaches and Harbors, and efforts put forth by volunteers and environmental organizations. As such, the Regional Board has used four years of Coastal Cleanup data from 2006-2009 to analyze the trash load to the beach by normalizing the pounds of trash collected per miles of beach that were cleaned per day, and extrapolating it to the pounds of trash per miles of beach per year (Table 11). The benchmark for beaches based on the Coastal Cleanup data is 113,150 lbs/mi/yr, or 24,941.91 gal/mi/yr.

Table 11. Average volume of trash collected from Coastal Cleanup Day from year 2006-2009.

Year	Trash Collected (pounds)	Length of Beach Cleaned (miles)	Pounds Collected/mile of Beach/day	Pounds Collected/ mile/year	Gallons Collected/ mile/year
2006	7,428	27	275.11		
2007	16,727	40.75	410.48		
2008	7,102	32.35	219.53		
2009	8,463	25	335.03		
Average			310.04	113,150	24,941.91

Table 12 summarizes the beaches and the tentative benchmarks for responsible jurisdictions, assuming a trash generation rate of 24,941.91 gal/mi/yr for beaches. The length of the beaches is determined based on Geographic Information Systems (GIS) data, and the Load Allocation is calculated by multiplying the length of the beach with 24,941.91 gal/mi/yr, or 113,150 lbs/mi/yr. In some cases, certain beaches are owned by one entity, and managed by another. Agencies and jurisdictions that own and/or manage the beach are jointly responsible to achieve LAs.

Table 12. Benchmarks for beaches, assuming a trash generation rate of 24,941.91 gal/mi/yr.

Responsible Parties	Nonpoint Source Area ($Mile^2$)	Baseline Load Allocation (gals/year)
Los Angeles County Department of Beaches and Harbors (joint responsibility is denoted below per individual beach, where applicable)		
Point Dume	0.99	24,583.1
Latigo Shores	0.04	997.7
Dan Blocker	1.05	26,147.3
Malibu	0.87	21,731.0
Las Tunas	1.40	34,935.0
Topanga	0.96	24,013.0
Will Rogers State Beach (Jointly responsible with California Department of Parks and Recreation)	2.62	65,227.8
Venice (Jointly responsible with the City of Los Angeles)	2.74	68,294.2
Marina Beach	0.28	6,978.6
Dockweiler State Beach (Jointly responsible with California Department of Parks and Recreation)	4.46	111,249.1
Manhattan Beach	2.04	50,922.8
Hermosa Beach (Jointly responsible with the City of Hermosa Beach)	1.90	47,321.2

Redondo Beach	1.57	39,066.4
Torrance	0.74	18,526.8
City of Santa Monica (joint responsibility is denoted below)		
Santa Monica Beach (Jointly responsible with California Department of Parks and Recreation)	3.05	76,019.3

VI. Margin of Safety

A margin of safety (MOS) accounts for uncertainties in the TMDL analysis. The MOS can be expressed as an explicit mass load that is not allocated to responsible parties, or included implicitly in the WLAs and LAs that are allocated. Because this TMDL sets WLAs and LAs as zero trash and plastic pellets, staff finds the TMDL includes an implicit MOS and that an explicit MOS is not necessary for this TMDL.

VII. Critical Conditions

Critical conditions for the Santa Monica Bay Watershed are based on three conditions that correlate with loading conditions:

- Major Storm (as proposed by responsible jurisdictions and responsible parties in the Trash Monitoring and Reporting Plan and approved by the Executive Officer);
- Wind advisories issued by the National Weather Service or by the California Highway Patrol;
- High visitation – On weekends and holidays year-round, and on days with special events scheduled at the beach.

Critical conditions must be considered when developing plans for monitoring, assessment and collection for trash and plastic pellet discharges.

VIII. TMDL Implementation and Compliance

This section describes TMDL implementation programs for compliance with the TMDL. Compliance with the TMDL is based on the Numeric Target and the Waste Load and Load Allocations which are defined as zero trash in and on the shorelines of the Santa Monica Bay, and no plastic pellets discharged from plastic manufacturers and facilities.

TMDL compliance is assessed in accordance with Dischargers' implementation of programs for point and nonpoint source trash and plastic pellet abatement, and attainment of the progressive trash reductions in accordance with the schedules below (Tables 13 and 14).

A. Implementation and Compliance for Trash

Compliance with the Santa Monica Bay Debris TMDL is based on installation of structural best management practices such as full capture or partial capture systems, institutional controls, or any best management practices, to attain a progressive reduction in the amount of trash in the Santa Monica Bay.

Nonpoint source trash dischargers may propose a program for a minimum frequency of assessment and collection in conjunction with best management practices (MFAC/BMP program). The MFAC/BMP program is required to attain a progressive reduction in the amount of trash collected from the water surface and shorelines through routine trash removal and implementation of BMPs. Dischargers may implement structural and/or nonstructural BMPs as required to attain a progressive reduction in the amount of trash and in the Santa Monica Bay. The TMDL Implementation Plan provides separate schedules for responsible jurisdictions to achieve zero trash for point sources by implementing full capture systems or other structural and/or nonstructural BMPs, and for nonpoint sources by using MFAC/BMP programs. Key provisions of the Implementation Plan include:

- Trash monitoring to provide data to revise Baseline Waste Load and Load Allocations, assess the effectiveness of BMPs and trash abatement programs, and assess the levels of trash on the Santa Monica Bay shorelines and its source area;
- TMDL Reconsideration by the Regional Board to revise Baseline Waste Load and Load Allocations and the minimum frequency of the MFAC program, if warranted.

The TMDL includes monitoring based on a Trash Monitoring and Reporting Plan (TMRP) developed by responsible jurisdictions and approved by the Executive Officer of the Regional Board. The minimum requirement for trash monitoring includes the assessment and quantification of trash collected from source areas of the Santa Monica Bay. The monitoring plan shall provide details on the frequency, location, and reporting of trash monitoring. Responsible jurisdictions shall propose a metric (e.g., weight, volume, pieces of trash) to measure the amount of trash in storm drains, and on the surrounding land areas. Responsible jurisdictions may include other metrics to provide data for revision of the Baseline Waste Load and Load Allocations, determine effectiveness of BMPs, and assess compliance with the TMDL. Responsible Jurisdictions may coordinate their trash monitoring activities for the Santa Monica Bay Watershed. Monitoring requirements are described in greater detail in Section IX and X.

If responsible jurisdictions do not use their TMRP to derive a new trash generation rate and accept Baseline Waste Load and Load Allocations, the WLAs and LAs may be based on appropriate data, either from the City of Calabasas, or the County of Los Angeles, normalized to the subwatershed area. The City of Calabasas study quantified trash recovered from a continuous deflector system. The County of Los Angeles study quantified trash collected from catch basin inserts and Continuous Deflective Separator (CDS) units in the Ballona Creek Watershed. The data that is referenced is based on historical trash generation rates at an existing monitoring location most similar to the Santa Monica Bay Watershed, where an amount of trash discharged to the Santa Monica Bay is permitted initially under the TMDL schedule.

Site-specific conditions for the Santa Monica Bay Watershed may differ from conditions of the Calabasas Study or the Ballona Creek Watershed study. As a result, responsible jurisdictions may use the data from their TMRP in order to derive a site-specific trash generation rate and Baseline Waste Load and Load Allocations. The Baseline Waste Load and Load Allocations are used as the basis for the progressive reduction of trash in the storm drains and tributaries for both point and nonpoint sources and represent the maximum amount of trash that can be discharged in conjunction with partial capture systems, institutional controls, or any other BMPs for point sources and the programs for minimum frequency of assessment and collection for nonpoint sources.

Implementation of Load and Waste Load Allocations for Trash

TMDL implementation may require BMPs to meet the progressive trash schedule. BMPs may be implemented through stormwater permits or through a variety of mechanisms such as a general WDR, a conditional waiver from waste discharge requirements, an individual WDR, prohibitions, among others for nonpoint source dischargers. Point source dischargers will implement BMPs in accordance with Waste Load Allocations incorporated into MS4 permits. Point sources may implement full capture systems, partial capture systems or any other structural or non-structural BMPs (e.g. institutional controls) to achieve Waste Load Allocations.

A.1 Point Sources Trash

Discharge of trash from stormdrains and conveyances to the Santa Monica Bay will be regulated through the MS4 NPDES Permits for Los Angeles County and for Ventura County, and the Caltrans Statewide Stormwater Permit.

There are alternatives for responsible jurisdictions to achieve compliance with waste load allocations. As established in the Los Angeles River Trash TMDL, point source dischargers can implement full capture systems to comply with the TMDL. Point source dischargers may also implement other structural and/or non-structural BMPs, sometimes referred to as partial capture systems and institutional controls.

A.1.1 Full Capture Treatment Systems

The amount of trash discharged to the Santa Monica Bay by an area serviced by a full-capture system will be considered to be in compliance with the final Waste Load Allocation for the drainage area, provided that the Full Capture Systems are adequately sized, maintained and maintenance records are available for inspection by the Regional Board.

A full capture system is any single device or series of devices that traps all particles retained by a 5 mm mesh screen and has a design treatment capacity of not less than the peak flow rate Q resulting from a one-year, one-hour storm in the subdrainage area. The Rational equation is used to compute the peak flow rate: $Q = C \times I \times A$, where Q = design flow rate (cubic feet per second, cfs); C = runoff coefficient (dimensionless); I = design rainfall intensity (inches per hour). Compliance with the TMDL schedule for full capture systems will be based on the percentage of the Santa Monica Bay watershed area that is outfitted with full capture systems. Alternatively, compliance will be based on the percentage of total catch basins

outfitted with full capture systems. The TMDL Implementation Plan provides a total of eight years to install full capture systems. Compliance with the final Waste Load Allocation will be assumed wherever Full Capture Systems are installed in the storm drains discharging to Santa Monica Bay. The installation of a Full Capture System by a discharger does not establish any presumption that the system is adequately sized or maintained, and the Regional Board will review sizing and other data in the future to validate that a system satisfies the criteria established in this TMDL for a Full Capture System.

A.1.2 Structural and/or Non-structural Best Management Practices (BMPs)

Compliance with the final waste load allocations may also be attained by implementing other structural and/or non-structural BMPs. Responsible jurisdictions shall propose structural and/or non-structural BMPs which will be identified in the Regional Board Executive Officer approved TMRP. These BMPs should be applied to prevent trash from entering the Santa Monica Bay (Figure 7). For example, street sweeping or partial capture systems installed in the catch basins or stormdrains or their combination, can be used to prevent trash from being discharged into the Santa Monica Bay at levels that exceed the Baseline Waste Load Allocation. Progressive reductions in trash will be achieved over eight years.

Measuring the effectiveness of partial-capture systems and institutional controls is more complicated. The discharge resulting from an area addressed by partial capture and/or institutional controls will be estimated using a mass balance approach, based on the daily generation rate (DGR) for the specific area. [Note: The DGR should not be confused with the trash generation rates obtained during baseline monitoring. The baseline monitoring program is designed to obtain "typical" trash generation rates for a given land use. Those values are then used to calculate a Permittee's baseline load allocation. The DGR is the average amount of trash deposited within a specified drainage area over a 24-hour period. The DGR will be used in a mass balance equation to estimate the amount of trash discharged during a rain event.]

Annual re-calculation of the DGR will serve as a measure of the effectiveness of source reduction measures including public education, enforcement of litter laws, etc. Source reduction measures will be accredited based on an annual recalculation of the DGR to allow for progressive improvement and/or to account for backsliding.

The DGR will be determined from direct measurement of trash deposited in the drainage area during any 30-day period from June 22nd to September 22nd of a given year[2], and recalculated every year thereafter. This three-month period was assumed to be a time characterized by high outdoor activity when trash is most likely to be deposited on the ground. The recommended method for measuring trash during this time period is to close the catch basins in a manner that prevents trash from being swept into the catch basins and then to collect trash on the ground via street sweeping, manual pickup, or other comparable means. The DGR will be calculated as the total amount of trash collected divided by 30 (the required duration of trash collection).

Accounting of DGR and trash removal via street sweeping, catch basin clean outs, etc. will be tracked in a central spreadsheet or database to facilitate the calculation of discharge for

[2] Provided no special events are schedule that may affect the representative nature of this period.

each rain event. The spreadsheet and/or database will be available to the Regional Board for inspection during normal working hours. The database/spreadsheet system will allow for the computation of calculated discharges and can be coordinated with enforcement. This database will be developed by cities or groups of cities.

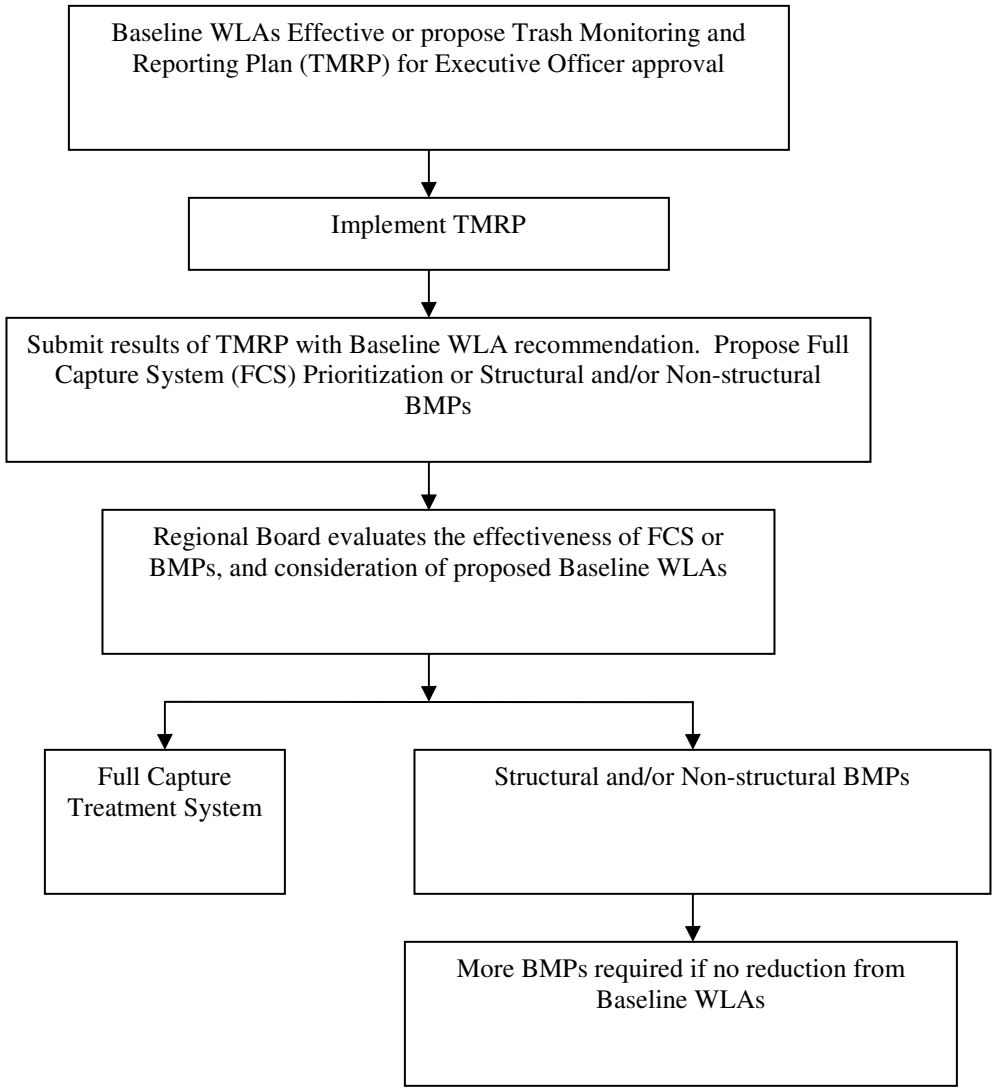
The Executive Officer may approve alternative compliance monitoring programs other than those described above, upon finding that the program will provide a scientifically-based estimate of the amount of trash discharged from the storm drain system.

Baseline Waste Load Allocations will apply at the effective date of the Santa Monica Bay Debris TMDL. Alternatively, responsible jurisdictions may propose a TMRP for Regional Board Executive Officer approval, which will collect site specific trash generation data to establish Baseline Waste Load Allocations. The first compliance point will be at the end of the fourth year with Waste Load Allocations equal to a 20% reduction of the amount of trash from the Baseline Waste Load Allocation. Compliance thereafter will be evaluated at the end of each successive storm season with Waste Load allocations equal to successive 20% reductions of the Baseline Waste Load Allocation (Table 14).

Responsible jurisdictions will be deemed in compliance with the final Waste Load Allocation upon results of the trash monitoring and reporting plan demonstrating that no trash greater than 5 mm in size is discharged to the Santa Monica Bay through point sources. If the amount of trash from point sources does not progressively decrease, then responsible jurisdictions must implement additional structural and/or non-structural BMPs to ensure reductions.

The Regional Board may revise the TMDL schedule and the Executive Officer approved TMRP based on the results of the trash monitoring and reporting program.

Figure 7. Flowchart for Point Source Implementation for Trash.



A.2 Nonpoint Source Trash

Two primary federal statutes establish framework in California for addressing nonpoint source (NPS) water pollution: Section 319 of the Clean Water Act (CWA) of 1987 and Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA). In accordance with these statutes, the state assesses water quality associated with nonpoint source pollution (NPS) and develops programs to address NPS. In 2004, The State Water Resource Control Board (SWRCB), in its continuing efforts to control NPS pollution in California, adopted the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan). The NPS Program Plan prescribes implementation and monitoring of Best Management Practices to address nonpoint source pollution.

LAs shall be implemented consistent with the Statewide Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program through a general waiver of

waste discharge requirements (WDR), individual waivers, a general WDR, an individual WDR, a memorandum of understanding (MOU), a cleanup and abatement order, or any other appropriate order or orders, provided the program is consistent with the assumptions and requirements of the reductions described in Table 7-34.3, below.

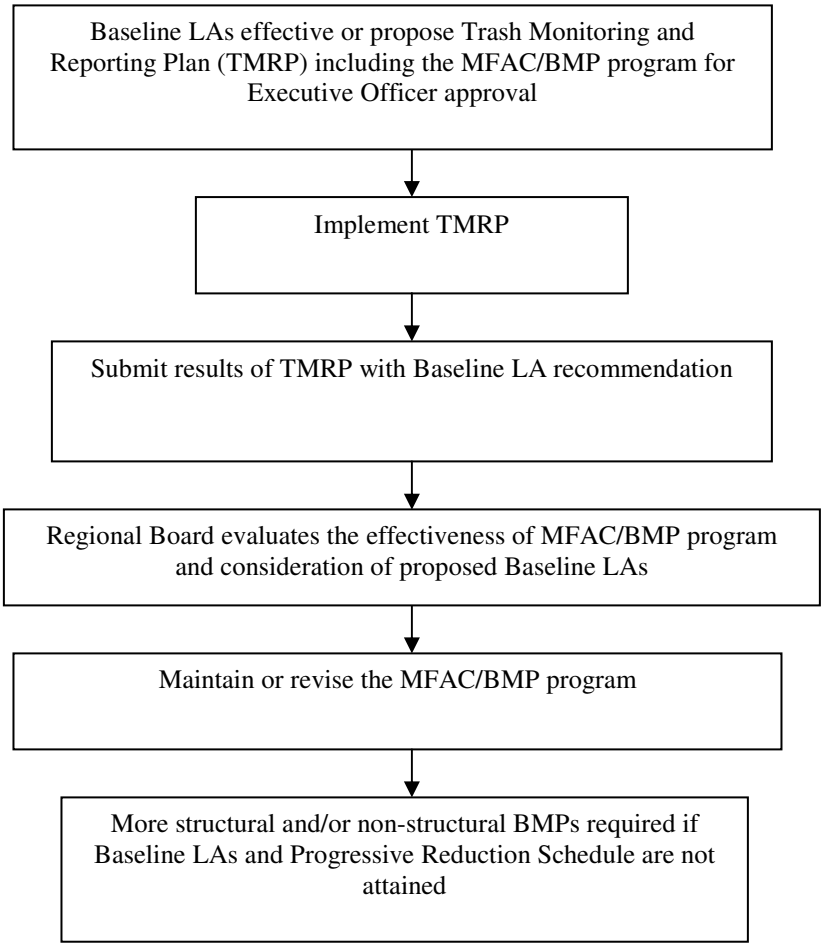
Nonpoint source dischargers may achieve the LAs by implementing an MFAC/BMP program approved by the Executive Officer. Responsible jurisdictions will be deemed in compliance with the LAs if an MFAC/BMP program, approved by the Executive Officer, demonstrates that there is no accumulation of trash, as defined in "Numeric Targets". The MFAC/BMP Program must include an initial minimum frequency of trash assessment and collection and suite of structural and/or nonstructural BMPs. The MFAC/BMP program shall include collection and disposal of all trash found in the source areas and along the shoreline. Responsible jurisdictions shall implement an initial suite of BMPs based on current trash management practices in land areas that are found to be sources of trash to waterbodies within the Santa Monica Bay WMA and to Santa Monica Bay.

The report submitted as a result of implementing the Trash Monitoring and Reporting Plan by responsible jurisdictions (also see Table 16) will provide data that may be used to propose an appropriate Baseline Load Allocation. Nonpoint source dischargers will be considered in compliance of attaining zero trash if trash does not accumulate in a deleterious amount on the surface and the shorelines to adversely affect the beneficial uses and cause nuisance to the Santa Monica Bay.

Responsible jurisdictions shall propose their initial minimum frequencies for clean up events in their respective Trash Monitoring and Reporting Plans, which must be approved by the Executive Officer of the Regional Board. In subsection A.2, below, cleanup frequencies are prescribed for open space and parks areas. In addition, as a general guideline for cleanup frequencies of beach and harbor areas, the Regional Board recommends the initial minimum frequencies for each responsible jurisdiction.

LAs will be implemented through a regulatory structure that provides for continued monitoring and iterative implementation of BMPs to attain zero trash within the TMDL Implementation Schedule (Figure 7). Based on the trash generation rate derived from the TMRP during the first two years of implementation, the Regional Board will consider the proposal of a site specific Load Allocation for individual waterbodies in the Santa Monica Bay Watershed (Table 14).

Figure 7. Implementation Schematic for Nonpoint Sources.



A.2.1 Responsible Jurisdictions for Non-Beach Open Space/Parks in the Santa Monica Bay Watershed

For each responsible jurisdiction, the initial minimum frequency shall be set as follows:

County of Los Angeles, County of Ventura, National Park Service, California Department of Parks and Recreation, and State Lands Commission are required to identify locations where the most trash is littered and accumulated within their jurisdictional areas in the proposed TMRP. These identified locations shall be cleaned with a frequency of no less than once per month throughout the year. The identified locations shall also be cleaned within 72 hours after critical conditions when safety hazards are removed, and immediately after special events held on the grounds of any responsible jurisdiction.

A.2.2 Beaches Along Santa Monica Bay

California Department of Parks and Recreation, Los Angeles County Department of Beaches and Harbors and the Cities of Hermosa Beach, Los Angeles, Santa Monica, and

Redondo Beach may achieve compliance with the Load Allocations by implementing an MFAC/BMP program approved by the Executive Officer. The MFAC/BMP Program includes an initial minimum frequency of trash assessment and collection and suite of structural and/or non-structural BMPs. The MFAC/BMP program shall include collection and disposal of all trash found on the shoreline and parking lots, or in areas close enough in proximity to the Santa Monica Bay such that wind or stormwater runoff may carry the trash into the bay.

For the beaches along the Santa Monica Bay, the Regional Board recommends that the Los Angeles County Department of Beaches and Harbors, and City of Santa Monica, together with the respective owners of specific beaches, including California Department of Parks and Recreation, and the Cities of Hermosa Beach, and Los Angeles:

1. Remove trash on the shorelines, beach and areas adjacent to Santa Monica Bay on a daily basis throughout the entire year.
2. Clean the shorelines, beach and areas adjacent to Santa Monica Bay immediately after critical conditions and after special events held at the beach, when no safety hazards are present.

Compliance Assessments

Assessment will be conducted at accessible areas as defined in the approved Trash Monitoring and Reporting Plan. Collection is defined as picking up 100% of trash and depositing it in a trash receptacle for proper disposal. All trash collected during the implementation of the MFAC, including trash from any beach raking and sanitizing operations, will be disposed of properly according to existing policies and regulations.

Compliance will be measured by quantifying trash left on the beaches between the high water line and the water immediately following the collection event. Zero trash must be demonstrated following collection events in order to be in compliance with the Santa Monica Bay Debris TMDL. Regional Board staff suggests that monitoring, based on the Rapid Trash Assessment protocol developed by the Storm Water Ambient Monitoring Program (SWAMP), be done once per beach per year during the hot season at a minimum of three locations per beach. Prioritization of the monitoring locations should be made by the responsible jurisdiction based on possible "hot spots" where trash may have a tendency to collect.

Afternoon Evaluations

In addition to compliance monitoring immediately following the collection event, the Regional Board recommends that the responsible jurisdictions for beaches also monitor twelve beaches per year (at least three locations per beach) at a given time in the afternoon to determine whether trash is showing a decreasing trend on the beaches. The same afternoon evaluation also applies to the beach under the management of the City of Santa Monica. Similar to the compliance monitoring following cleanup events, the locations chosen by the responsible jurisdiction will be prioritized based on possible "hot spots" where trash tends to collect on the beach. These monitoring events will include the shoreline and parking lots, or areas close enough in proximity to the Santa Monica Bay. If the afternoon monitoring does not show a decreasing trend of trash left on the beach, the responsible jurisdiction must implement further BMPs in order to remain in compliance with the Santa Monica Bay Debris TMDL.

The trash quantity collected from representative beaches in the afternoon is to compare with the benchmark established by data from Coastal Cleanup Days. The temporal data shall exhibit a decreasing trend which indicates the effectiveness of implementing structural or non-structural BMPs. If a decreasing trend is not observed, the responsible jurisdiction shall implement additional BMPs.

A.2.3 Harbors in the Santa Monica Bay

The State Water Resources Control Board is currently developing a statewide Marina Permit, which intends to regulate marinas and mooring fields in coastal regions of California that contain slips or mooring locations for 10 or more boats. The tentative requirements may be applied to discharges from general marina operations that result in the deposition of debris on the ground and light enough to be swept away by flowing storm water and/or air currents into marina waters. The Santa Monica Bay Debris TMDL will be consistent with the final requirements of the Statewide Marina Permit. Responsible jurisdictions shall fulfill the requirements set forth in this Santa Monica Bay Debris TMDL and continue to comply with both the TMDL and permit requirements once the permit becomes effective.

Los Angeles County Department of Beaches and Harbors and the City of Redondo Beach are responsible jurisdictions for harbors in the Santa Monica Bay. The responsible jurisdictions can achieve compliance with the Santa Monica Bay Debris TMDL by implementing an MFAC/BMP program that shall include collection and disposal of all trash found on harbor property (land) in areas close enough in proximity to the Santa Monica Bay such that wind or stormwater sheet flow may carry the trash into the bay, and in the water where it is accessible and safe to collect trash.

For harbors in the Santa Monica Bay, the Regional Board recommends that the Los Angeles County Department of Beaches and Harbors and the City of Redondo Beach:

1. Remove trash from the land areas of the harbors that are adjacent to the Santa Monica Bay on a daily basis throughout the year.
2. Remove trash on the accessible water areas of the harbors on a weekly basis throughout the year.
3. Clean the land areas of the harbors that are adjacent to the Santa Monica Bay, and clean accessible water areas of the harbors immediately after critical conditions and after special events held at the harbors, when no safety hazards are present.

The TMRP will define accessible areas where the assessment will take place, both on the water, and on the land areas of the harbors. Collection is defined as picking up and properly disposing of 100% of the trash.

Los Angeles County Department of Beaches and Harbors and the City of Redondo Beach shall also conduct compliance assessment and afternoon evaluations for harbors as described in A.2.2.

At the end of the implementation period, a revised MFAC/BMP program may be required if the Executive Officer determines that the amount of trash accumulating between collections is causing nuisance or otherwise adversely affecting beneficial uses. Specifically, the Executive Officer may approve or require a revised assessment and collection frequency and definition of the critical conditions:

(a) To prevent trash from accumulating in deleterious amounts that cause nuisance or adversely affect beneficial uses between collections;
(b) To reflect the results of trash assessment and collection;
(c) If the amount of trash collected does not show a decreasing trend, where necessary, such that a shorter interval between collections is warranted; or
(d) If the amount of trash collected is decreasing such that a longer interval between collections is warranted.

With regard to (a), (b) or (c), above, the Executive Officer is authorized to allow responsible jurisdictions to implement additional structural and/or non-structural BMPs in lieu of modifying the monitoring frequency.

Alternatively, responsible jurisdictions may propose, or the Regional Board may impose, an alternative program, provided the program is consistent with the assumptions and requirements of the reductions described in Table 16, below.

B. Implementation and Compliance for Plastic Pellets

As the Debris TMDL is inclusive of plastic pellets, industries that manufacture, store, transport, or otherwise handle plastic pellets as raw material must comply with a WLA of zero plastic pellets. The zero WLA for the plastic pellets requires that no plastic pellets are allowed to be released, found, or accumulated outside of the premises of the industries or in any stormwater capture device that may be connected with the MS4. Consistent with California Water Code § 13367 and 40 CFR 122.26(b)(12). WLAs for plastic pellets are assigned to permittees of the Industrial Storm Water General Permit (Order No. 97-03-DWQ, and NPDES Permit No. CAS 000001) within the Santa Monica Bay WMA. The Standard Industry Classification (SIC) codes associated with industrial activities involving plastic pellets may include, but are not limited to, 282X, 305X, 308X, 39XX, 25XX, 3261, 3357, 373X, and 2893. Additionally, industrial facilities with the term "plastic" in the facility or operator name, regardless of the SIC code, may be subject to the WLA for plastic pellets. Other industrial permittees within the Santa Monica Bay WMA that fall within the above categories, but are regulated through other general permits and/or individual industrial storm water permits are also required to comply with the WLA for plastic pellets.

Industries must comply with the Statewide Industrial Permit or other general or individual industrial permits, which require a Stormwater Pollution Prevention Plan (SWPPP) to be prepared and kept onsite at all times. The SWPPP should address the areas where pellets tend to spill, as well as an overall plan to keep plastic pellets from being released off of the premises. The SWPPP shall incorporate structural and nonstructural BMPs that are implemented to keep pellets on site, including specific practices that are used to clean up incidental or large spills.

Jurisdictions and agencies identified as responsible jurisdictions for point sources of trash in this Santa Monica Bay Debris TMDL and in the existing Malibu Creek and Ballona Creek Trash TMDLs shall prepare a Plastic Pellet Monitoring and Reporting Plan (PMRP). The PMRP will serve to monitor the amount of plastic pellets being discharged from the MS4, establish triggers for a possible need to increase industrial facility inspections and enforcement of SWPPP requirements for industrial facilities identified as responsible for the plastic pellet WLA, and address possible plastic pellet spills. In the event of a plastic pellet spill, the Regional Board shall be notified by the agency or jurisdiction within 24 hours of the responsible agency or jurisdiction becoming aware of the spill. The PMRP shall include protocols for a timely and appropriate response to possible plastic pellets spills within their jurisdictional area, and a comprehensive plan to ensure that plastic pellets are contained.

The foreseeable methods of compliance with the plastic pellet Waste Load Allocation assigned to industrial permittees, include the implementation of best management practices such as appropriate containment systems, sealed containers, vacuum devices for cleaning, and frequent inspection and cleaning at operational areas and outlets of water discharge, to effectively control and prevent discharges of pre-production plastics pellets. In addition, necessary best management practices shall be exercised to eliminate spillage of plastic pellets during transportation that could be later mobilized and transported to waters of the State. These BMPs are discussed further in Sections F and G, below.

C. Coordinated Compliance

Responsible jurisdictions for this TMDL include both point source and nonpoint source dischargers. Compliance with the TMDL may be based on a coordinated Monitoring and Reporting work plan that outlines TMDL responsibilities for each responsible jurisdiction. Dischargers interested in coordinated compliance shall submit a Coordinated Monitoring and Reporting Compliance plan that outlines BMPs that will be implemented and the schedule for implementing the BMPs and MFAC program.

D. Structural BMPs

A wide variety of methods that can reduce and eliminate trash impairment in Santa Monica Bay are listed below. Structural full capture systems can be put in areas that are extensively drained by municipal separate stormwater sewer systems.

D.1 Structural BMPs for Trash

Catch Basins and Catch Basin Inserts

A catch basin or storm drain inlet is an inlet to the storm drain system that typically includes a grate or curb opening where stormwater enters the catch basin and a sump to capture sediment, debris and associated pollutants. They are also used in combined sewer watersheds to capture floatables and settle some solids. Catch basins act as pretreatment for other treatment practices by capturing large particles. The performance of catch basins at removing sediment and other pollutants depends on the design of the catch basin, and routine maintenance to retain the storage available in the sump to capture sediment.

Within a catch basin a "catch basin insert," may also be used to filter runoff entering the catch basin. There are several types of catch basin inserts. Catch basin and storm drain inserts may rely on screens, filters, bags, trays, and diversion chambers to collect and divert trash and debris.

Vortex Separation Systems

Vortex Separation Systems (VSS) units capture almost all trash deposited into a storm drain system. A VSS unit diverts the incoming flow of storm water and pollutants into a pollutant separation and containment chamber. Solids within the separation chamber are kept in continuous motion, and are prevented from blocking the screen so that water can pass through the screen and flow downstream. Solid pollutants including trash, debris and coarse sediments are retained in a centrally located solids catchment chamber with the heavier solids ultimately settling into the base of the unit or sump. This is a permanent device that can be retrofitted for oil separation as well. Outfitting a large drainage with a number of large VSS units may be less costly than using a larger number of small VSS units.

Trash Nets

Trash nets are devices using the natural energy of the flow to trap trash, floatables and solids in disposable mesh nets. Trash nets can be placed in different ways, such as a retrofit on the end of an outfall, in line with an outfall pipe (underground), or floating at the end of an outfall.

“Release nets” are a relatively economical way to monitor trash loads from municipal drainage systems. However, in general, they can only be used to monitor or intercept trash at the end of a pipe and are considered to be partial capture systems, as the nets are usually sized at a 1/2" to 1" mesh. These nets are attached to the end of pipe systems. The nets remain in place on the end of the drain until water levels upstream of the net rise sufficiently to release a catch that holds the net in place. The water level may rise from either the bag being too full to allow sufficient water to pass, or from a disturbance during very high flows. When the nets release they are attached to the side of the pipe by a steel cable and as they are washed downstream (a yard or so) are tethered off so that no pollutants from within the bags are washed out.

Preliminary observations suggest that the nets rarely fill sufficiently to cause the bags to release. And therefore, if they are cleaned after a storm event, the entire quantity of material is captured and can be measured for monitoring purposes using two bags per trap. This makes it easy to replace the full or partially full bag with an empty one, so that the first bag can be taken to a laboratory for analysis without manual handling of the material it contains.

The nets are valid devices because of the ease of maintenance and also because the devices can be relocated after a set period at one location (provided the pipe diameters are the same).

Gross Solids Removal Devices

Several Gross Solids Removal Devices (GSRDs) were developed by the California Department of Transportation (Caltrans) to be retrofitted into existing highway drainage systems or implemented in future highway drainage systems. GSRDs are structures that remove litter and solids 5 mm (0.25 inch nominal) and larger from the stormwater runoff using various screening technologies. Overflow devices are incorporated, and the usual design of the overflow release device is based upon the design storm for the roadway. Though designed to capture litter, the devices can also capture some of the vegetative debris.

The Caltrans' GSRD Pilot Program consists of multiple phases with each phase representing one pilot study. A pilot study generally consists of one or more devices that are developed from concept, advanced through design and installation, and placed in service for two years of testing to evaluate overall performance. Three types of GSRDs have been shown the most promising: linear radial and two versions using an inclined screen.

Harbor Trash Skimmer Units

A harbor trash skimmer is a unit that is partially submerged in the water, and anchored to a dock. It uses a motor to displace water, and traps floating trash and debris, as it is sucked into the unit. The unit retains floating trash, and must be emptied.

Marine Trash Skimmer Boats

Marine trash skimmer boats consist of a catamaran type, twin hull vessel on which are mounted hydraulically powered and controlled open mesh conveyor systems to move materials. Twin, over-the-rear hydraulically powered propellers are used to clear debris without the need to take the vessel out of the water. A front mounted continuous conveyor can be lowered into the water and is capable of skimming floating debris off the surface to depths of up to 2-1/2 feet below the surface, 16 feet wide.

Debris coming up the main pickup conveyor dumps into the vessel's storage area which, with its sidewalls, can retain and store up to 12,000 pounds or 700 cubic feet of material. Once fully loaded, the vessel heads back to shore, where the operator offloads the material into dumpsters or dump trucks for off-site disposal.

D.2 Structural BMPs for Plastic Pellets

Plastic industries can utilize BMPs to ensure the complete containment of plastic pellets on site.

Containment Systems

Appropriate containment systems can be installed at all onsite storm drain discharge locations that are down-gradient of areas where preproduction plastic is present or transferred. A containment system can be a device or series of devices that traps all particles retained by a one millimeter mesh screen and has a design treatment capacity of not less than the peak flowrate resulting from a one-year, one-hour storm in each of the down-gradient drainage areas.

Capture Devices

At all points of storage and transfer of preproduction plastic, capture devices can be put in place under transfer valves and devices used in loading, unloading, or other transfer of preproduction plastic.

D.2.1 Landscape BMPs

Catch Basin Inserts

Most existing curb inlets can be retrofitted with filters to catch debris. Although many catch basin inserts capture particles larger than 5 millimeters, some technologies have been developed that will capture everything larger than fine sand. The screen creates a shearing action, and water flows across the surface which has small openings. The water can penetrate through, and the dewatered debris gets filtered out into a debris compartment.

Grading/Berms

Grading floors and parking lots of the facilities, or adding berms can ensure that plastic pellets will not be discharged. These BMPs keep pellets on site by not allowing them to be taken by stormwater or wind across a large area, where they can be dispersed and end up in the MS4. Berms and grading can allow the pellets to be directed and stormwater to flow to a smaller area, where they can be filtered out by other BMPs.

Retaining Walls

Short retaining walls can keep pellets on site. Similarly to grading and berms, retaining walls can enclose a facility and keep a specific area open, where other BMPs can catch and filter out plastic pellets.

E. Non-Structural BMPs

A wide variety of methods to address the trash impairment in Santa Monica Bay are listed below. Responsible jurisdictions shall propose the monitoring plan as well as the mitigation measures incorporating an individual method or combinations to progressively reduce nonpoint source trash. Non-structural BMPs may provide advantages over structural full capture systems in areas that are not extensively drained by municipal separate stormwater sewer systems. Foremost, institutional controls offer other societal benefits associated with reducing litter in our city streets, parks and other public areas. The capital investment required to implement non-structural BMPs is generally less than that for structural BMPs.

E.1 Non-structural BMPs for Trash

Litter Control

It is noted that ordinances which prohibit littering are already in place, listed below:

- County of Los Angeles (12.80.440 Littering and other discharge of polluting or damaging substances prohibited.)

"No Person shall cause any refuse, rubbish, food waste, garbage, or any other discarded or abandoned objects to be littered, thrown, deposited, placed, left, accumulated, maintained or kept in or upon any street, alley, sidewalk, storm drain, inlet, catch basin, conduit, drainage structure, place of business, or upon any public or private property except when such materials are placed in containers, bags, recycling bins, or other lawfully established waste disposal facilities protected from stormwater or runoff."

- City of Ventura (i.e., San Buenaventura), Sec. 8.250.030. Littering; fine; picking up litter (Code 1971, § 4362)

  "It is unlawful to litter or cause to be littered in or upon any public or private property, or in any container, as described in this chapter, of another person without their permission."

- Ventura County (6923 Litter.)

  "No Person shall throw, deposit, leave, maintain, keep, or permit to be thrown, deposited, kept, or maintained, in or upon any public or private driveway, parking area, street, alley, sidewalk, or component of the Storm Drain System or any Watercourse, any refuse, rubbish, garbage, litter, or other discarded or abandoned objects, articles, accumulations, and/or Pollutants so that the same may cause or contribute to pollution. Any Owner or Occupant of the property or responsible person who fails to remove pollutants within a reasonable time, as determined by the Director, may be charged with a violation of this Chapter."

- California Vehicle Code

  Throwing Substances on Highways or Adjoining Areas
  23111. No person in any vehicle and no pedestrian shall throw or discharge from or upon any road or highway or adjoining area, public or private, any lighted or nonlighted cigarette, cigar, match, or any flaming or glowing substance. This section shall be known as the Paul Buzzo Act. (Amended Ch. 1548, Stats. 1970. Effective November 23, 1970)

  Throwing, Depositing, or Dumping Matter on Highway
  23112. (a) No person shall throw or deposit, nor shall the registered owner or the driver, if such owner is not then present in the vehicle, aid or abet in the throwing or depositing upon any highway any bottle, can, garbage, glass, nail, offal, paper, wire, any substance likely to injure or damage traffic using the highway, or any noisome, nauseous, or offensive matter of any kind.
  (b) No person shall place, deposit or dump, or cause to be placed, deposited or dumped, any rocks, refuse, garbage, or dirt in or upon any highway, including any portion of the right-of-way thereof, without the consent of the state or local agency having jurisdiction over the highway. (Amended Ch. 74, Stats. 1980. Effective January 1, 1981)

- Fish and Game Code (Division 6, Part 1, Chapter 2, Article 1)

  5650. …It is unlawful to deposit in, permit to pass into, or place where it can pass into the waters of this state any of the following:

(1) Any petroleum, acid, coal or oil tar, lampblack, aniline, asphalt, bitumen, or residuary product of petroleum, or carbonaceous material or substance.
(2) Any refuse, liquid or solid, from any refinery, gas house, tannery, distillery, chemical works, mill, or factory of any kind.
(3) Any sawdust, shavings, slabs, or edgings.
(4) Any factory refuse, lime, or slag.
(5) Any cocculus indicus.
(6) Any substance or material deleterious to fish, plant life, or bird life.

5652. It is unlawful to deposit, permit to pass into, or place where it can pass into the waters of the state, or to abandon, dispose of, or throw away, within 150 feet of the high-water mark of the waters of the state, any cans, bottles, garbage, motor vehicle or parts thereof, rubbish, or the viscera or carcass of any dead mammal, or the carcass of any dead bird.

Boating Laws

- International Treaty to Prevent Pollution from Ships (MARPOL Annex V)
  All ships of 400 gross tonnage and above and every ship certified to carry 15 persons or more will have to carry a Garbage Management Plan, to include written procedures for collecting, storing, processing and disposing of garbage, including the use of equipment on board. The Garbage Management Plan should designate the person responsible for carrying out the plan and should be in the working language of the crew.

  Every ship of 12 metres or more in length must also display placards notifying passengers and crew of the disposal requirements of the regulation; the placards should be in the official language of the ship's flag State and also in English or French for ships travelling to other States' ports or offshore terminals.

- 1899 Rivers and Harbors Act/Federal Refuse Act (1899 33 U.S.C. §407)
  Prohibits discharging or depositing any refuse matter of any kind into United States waters. Refuse includes: garbage, trash, oil and other liquid pollutants.

- Marine Plastic Pollution Research and Control Act

  33 CFR 151.57. Requires all oceangoing vessels 40 feet or more in length used in commerce or equipped with a galley and berthing to have a written waste management plan. The Master or person in charge of the vessel is responsible for ensuring that a written waste management plan is on board, and that each person handling garbage follows that plan. The plan must describe the vessel's procedures for collecting, processing, storing and discharging garbage, and designate the person who is in charge of carrying out the plan. Garbage (including food wastes) may not be thrown overboard on inland waters or in the ocean within three miles of land. Plastic may not be thrown overboard anywhere.

  33 CFR 151.59. Requires all vessels, 26 feet or longer to display, in a prominent place where the crew and the passengers can read it, an informational placard that notifies the reader of the following:

  (1) The discharge of plastic or garbage mixed with plastic into any waters is prohibited.

(2) The discharge of all garbage is prohibited in the navigable waters of the United States and, in all other waters, within three nautical miles of the nearest land.

(3) The discharge of dunnage, lining, and packing materials that float is prohibited within 25 nautical miles of the nearest land.

- California Health and Safety Code Section 117475-117500 (Pollution of navigable waters) 117480. Every person who places, deposits, or dumps any garbage in or upon the navigable waters of this state, or who places, deposits, or loads it upon any vessel, with intent that it shall be dumped or deposited in or upon the navigable waters of this state, or at any point in the ocean within twenty miles of any point on the coast line of the state, is guilty of a misdemeanor.

- California Health and Safety Code Section 117550-117560 (Prohibited Waste Disposal) 117555. A person who places, deposits, or dumps, or who causes to be placed, deposited, or dumped, or who causes or allows to overflow, sewage, sludge, cesspool or septic tank effluent, accumulation of human excreta, or solid waste, in or upon a street, alley, public highway, or road in common use or upon a public park or other public property other than property designated or set aside for that purpose by the governing board or body having charge of the property, or upon private property without the owner's consent, is guilty of a misdemeanor.

Trash Receptacles

Most trash disposed of on the ground may result from the lack of trash receptacles. Installing trash receptacles can reduce nonpoint source trash loadings. The receptacles shall be visible and conveniently reachable for all park users. During the picnic seasons, sufficient trash and hot coal receptacles in the picnic area should be provided. Receptacles shall be equipped with lids to prevent wildlife from digging through trash or the wind from re-mobilizing the trash inside. Receptacles may be decorated but shall not cause visual intrusion to the background environment.

Varieties of land uses determine the proper locations and necessary density of the trash receptacles. More receptacles are needed along trails, near park entrances and exits, adjacent to picnic areas or areas with higher activity frequencies. Sanitation should be maintained to avoid nuisances.

Smoking Bans

- Santa Monica Municipal Code (Article 4, Chapter 4.44, Regulation of Smoking)

  "It is unlawful to smoke in the following places:…Any public beach; anywhere on the Santa Monica Pier; except in designated areas;…"

  "Disposal of Smoking Waste. No person shall dispose of any cigarette, cigar or tobacco, or any part of a cigarette or cigar, in any place where smoking is prohibited under this Chapter, except in a designated waste disposal container."

- City of Malibu Municipal Code (12.08.035 Smoking prohibited on beaches.)

(Ord. 265 § 1, 2004)

"Notwithstanding the provisions of Section 12.08.020(A), it is unlawful to smoke on any public beach or any area of the Malibu Pier not designated for smoking within the city of Malibu. For the purpose of this section, "smoking" means inhaling, exhaling, burning, or carrying any lighted cigarette, cigar or pipe. For the purpose of this section, beach shall not include parking lots or roadways."

Plastic Bag Bans

- City of Malibu Municipal Code (9.28.020 Plastic shopping bags prohibited.)
  (Ord. 323 § 1 (part), 2008)

  "A. No affected retail establishment, restaurant, vendor or nonprofit vendor shall provide plastic bags or compostable plastic bags to customers.
  B. Nothing in this section shall be read to preclude affected retail establishments, vendors and nonprofit vendors from making recyclable paper bags available to customers.
  C. No person shall distribute plastic bags or compostable plastic bags at any city facility or any event held on city property.
  D. This chapter shall apply only to plastic bags or compostable plastic bags provided at the point of sale for the purpose of carrying away goods. This chapter shall not apply to single-use plastic produce bags distributed in a grocery store exclusively for the purpose of transporting produce to the point of sale."

Polystyrene Bans

- City of Malibu Municipal Code (9.24.020 Food packaging prohibitions.)
  (Ord. 286 § 1 (part), 2005)

  "A. No restaurant, food packager, retail food vendor, vendor or nonprofit food provider shall provide prepared food to its customers in any food packaging that utilizes expanded polystyrene.
  B. The city of Malibu shall prohibit the use of expanded polystyrene food packaging at all city facilities. The city of Malibu shall not purchase or acquire expanded polystyrene food packaging.
  C. The use or distribution of expanded polystyrene food packaging at special events sponsored or co-sponsored by the city of Malibu shall be prohibited. This prohibition shall apply to the event organizers, agents of the event organizers, event food vendors and any other party (including nonprofit organizations) who enter into an agreement with one or more of the co-sponsors of the event to sell prepared food at the event or otherwise provide an event-related service.
  D. All facility rental agreements for any city-owned property or facility shall include a provision requiring contracting parties to assume responsibility for preventing the utilization and/or distribution of expanded polystyrene food packaging at the associated function. The facility rental agreement shall indicate that the violating contractor's security deposit will be forfeited if the parks and recreation director, or his or her designee, determines that expanded polystyrene food packaging was utilized in violation of the rental agreement."

Enforcement of Litter Laws

The existing litter laws shall be posted in the prominent location for visitors or resident to understand the regulations. It is to be noted that ordinances that prohibit litter are already in place in most cities because cities recognize that trash has become a pollutant in the storm drain system when exposed to storm water or any runoff, and prohibit the disposal of trash on public land.

Patrolling or designated personnel shall have authorities to illustrate, execute, and enforce the litter laws. The effectiveness of enforcement should be monitored.

Garbage Collection

Increasing the frequency of garbage collection may keep trash cans and receptacles from overflowing. An overflowing trash may cause the lid to be propped open, or may prevent a lid from being used to cover the trash can. This can lead to trash being blown away, or wildlife taking trash out of the receptacles. An increase in the frequency of collection would help to ensure that trash was not accessible to wind or wildlife.

Street Sweeping

Street sweeping is one of most effective methods to keep debris, vegetation wastes, and trash away from catch basins. Although the correlation between street sweeping frequency and amount of trash collected in the waterbody has not been confirmed in the Santa Monica Bay Watershed area, it is convincing that more street sweeping will prevent more trash from being flushed by stormwater to the catch basins, and from being discharged to the waterbodies of concern.

Most municipalities have been undergoing or have had contracts with Los Angeles County and Ventura County for street sweeping programs. In the counties' unincorporated areas, street sweeping frequency may be increased to reduce trash loading.

Public Education

Public education refers to posting information, giving a presentation, or conducting direct or indirect communication with individuals. This outreach should be applied to public entities such as city halls, schools, community centers, senior centers, and to private meeting/activity locations.

The educational materials should include the relevant ordinances, the importance of protecting the environment, possible environmental and biological impacts from pollution, and the necessary response if pollution occurs.

Community Involvement

Involving communities may be more effective in promoting the importance of protecting water quality and the environment. The bonding between residents in the community makes the community more influential in educating residents about right concepts. Communities can organize activities to illustrate that environmental protection involves every individual's continuous efforts.

Beach Cleanups/Coastal Cleanup Day

Organizations such as Heal the Bay host voluntary beach cleanups throughout the year. The cleanups are hands-on opportunities for volunteers to take ownership and directly improve the condition of Santa Monica Bay beaches.

Recycling Program

A recycling program shall be developed to minimize trash sources in the vicinity of the Santa Monica Bay.

Reporting System

Patrol personnel, park and beach users, or residents should report accumulation of trash or illegal disposal of trash to the waterbodies and their adjacent areas. Information with a toll-free number and communication devise shall be conveniently available near the waterbodies for timely reporting. Responsible jurisdictions, after receiving reports, should conduct inspections to formulate proper cleanup actions.

Stenciling

Stencils are to remind the residents and park users of the importance of maintaining water quality and of the existing ordinances. Signs should be placed in prominent locations where most people will view them, and should contain appropriate symbols as well as clear written messages, and cite the appropriate federal, state and county codes including the largest possible penalty amount for violation of codes.

Consideration of Picnic Area Relocation

Trash found in the waterbodies may be the result of stormwater flushing or wind re-mobilizing trash originally disposed of around picnic areas. If stormwater or wind is the dominant factor causing trash impairment, and trash is constantly found near picnic areas, it may be a solution to reconsider the proper location of picnic area.

The further the picnic area away from waterbodies, the longer time or more mobilization energy it needs from stormwater or wind to carry trash to waterbodies of concerns. Trash may be cleaned before reaching waterbodies. A proper monitoring period to analyze the cause of trash is necessary prior to considering this option.

Imposition of Trash Tax

Trash often discovered on source areas in the Santa Monica Bay Watershed is paper or plastic food or beverage containers, plastic bottles, paper plates, aluminum cans, or plastic bags. This trash shares the same characteristics as packaging utilized in the fast food stores. The evidence of trash causing the Santa Monica Bay trash impairment may be used to justify an increase in the retail price of disposable food or beverage packaging to compensate for the potential environmental impacts. The additional tax income can contribute to preventive or cleanup actions for the Santa Monica Bay.

The City of Oakland enacted the first tax on fast food restaurants and convenience stores in the nation. They are using the money they raise from the litter tax to hire crews to clean up litter.

Cooperation of Potential Sources of Trash

Stores carrying goods considered potential sources of trash to the waterbody or its adjacent areas can advise their patrons to handle the packaging, residuals or any trash parts in an

environmentally friendly manner. Similar to the stencils, signs with clear language containing ordinances, and a penalty of violation should be posted near the cashier, exit and parking lot.

Surveillance Camera

Surveillance cameras can be installed to monitor the water quality and any illegal disposal which may require immediate cleanup. They can also be used to enforce the littering laws if necessary.

Programs of Adopting Waterbodies, Parks, etc.

This concept is adapted from the "adopt a highway" program. The participation from industries in the Santa Monica Bay Watershed will help the responsible jurisdictions to maintain the cleanliness of the environment, and increase the cleaning frequency. Industries or any entities that contribute resources, time, or efforts to keep the environment clean may be encouraged by being acknowledged publicly or financially.

E.2 Non-structural BMPs for Plastic Pellets

- Zero Pellet Loss Programs

  Operation Clean Sweep is a program developed by the Society of the Plastics Industry and the American Plastics Council. The program focuses on zero pellet loss, and involves BMP training and education for industries. Issues that may be addressed in these programs include:

  Education and Training in the Workplace

  Plastic industries can hold training for new employees and refresher courses for existing employees every year, which address specific non-structural BMPs that should be applied in the workplace. At the end of the training, employees could sign agreements that ensure that they will carry out these BMPs on a daily basis.

  Sweeping, Vacuuming

  Industries should have the proper equipment present and in working order so that employees can clean large or incidental plastic pellet spills as they occur. For example, brooms, dust pans, and vacuums with the proper attachments should be available and utilized immediately after each transfer of pellets or anytime there are pellets released onto the premises.

  Bins and Trays to Catch Pellets

  Placing bins or trays underneath transfer points while transferring pellets can ensure that no loose pellets fall onto the ground. Plastic pellets that are spilled will be caught in the bins or on the trays.

  Sealing and Double Bagging Pellets

  Keeping plastic pellets double bagged and sealed during transport or when stored will keep pellets from being unnecessarily spilled. In addition, at all points of preproduction plastic storage and transfer, measures can be taken to prevent discharge by making sure that sealed containers or bags are durable enough so as not to rupture under typical loading and unloading activities.

Sealing Transport Cars/Carriers

When plastic pellets are being transported, completely sealing railroad cars and trucks will keep pellets from escaping.

F. Implementation Schedule

The TMDL Implementation Schedule is designed to provide responsible jurisdictions flexibility to implement structural and non-structural BMPs to address trash and plastic pellets in the source areas of the Santa Monica Bay Watershed. Implementation consists of implementing a suite of the aforementioned BMPs and development of monitoring plans by responsible jurisdictions and implementation of the Executive Officer approved Trash Monitoring and Reporting Plan.

Table 13. Implementation Schedule for Point Sources for Trash

Task No.	Task	Responsible Jurisdiction	Date
1	Submit Trash Monitoring and Reporting Plan (TMRP), including a plan for defining the trash baseline WLA, a proposed definition of "major rain event," and a Plastic Pellet Monitoring and Reporting Plan (PMRP) for monitoring plastic pellet discharges from the MS4, increased industrial facility inspections and enforcement, and response to possible plastic pellet spills.	California Department of Transportation, Los Angeles County Flood Control District, Los Angeles County, Ventura County Watershed Protection District, County of Ventura, and Cities of Agoura Hills, Calabasas, Culver City, El Segundo, Hermosa Beach, Los Angeles, Malibu, Manhattan Beach, Palos Verdes Estates, Rancho Palos Verdes, Redondo Beach, Rolling Hills, Rolling Hills Estates, Santa Monica, Thousand Oaks, Torrance, and Westlake Village. For PMRP ONLY[3] The Cities of Beverly Hills, Inglewood, West Hollywood, and Hidden Hills.	6 months from effective date of TMDL. If a plan is not approved by the Executive Officer within 9 months, the Executive Officer will establish appropriate monitoring plans.
2	Implement TMRP and PMRP.	California Department of Transportation, Los Angeles County Flood Control District, Los Angeles County, Ventura County Watershed Protection District, County of Ventura, and Cities of Agoura Hills, Calabasas, Culver City, El Segundo, Hermosa Beach, Los Angeles, Malibu, Manhattan Beach, Palos Verdes Estates, Rancho Palos Verdes, Redondo Beach, Rolling Hills, Rolling Hills Estates, Santa Monica, Thousand Oaks, Torrance, and Westlake Village. For PMRP ONLY[3] The Cities of Beverly Hills, Inglewood, West Hollywood, and Hidden Hills.	6 months from receipt of letter of approval from Regional Board Executive Officer, or the date a plan is established by the Executive Officer.
3	Submit results of implementing TMRP and	California Department of Transportation, Los Angeles County, Ventura County Watershed	One year from receipt of letter of approval for the

[3] The monitoring and reporting requirements under the Ballona Creek Trash TMDL and Malibu Creek Trash TMDL for areas within those subwatersheds fulfill the requirement herein to prepare and implement a TMRP.

	PMRP, recommend trash baseline WLA, and propose prioritization of Full Capture System installation or implementation of other measures to attain the required trash and plastic pellet reduction.	Protection District, County of Ventura, and Cities of Agoura Hills, Calabasas, Culver City, El Segundo, Hermosa Beach, Los Angeles, Malibu, Manhattan Beach, Palos Verdes Estates, Rancho Palos Verdes, Redondo Beach, Rolling Hills, Rolling Hills Estates, Santa Monica, Thousand Oaks, Torrance, and Westlake Village. For PMRP ONLY[3] The Cities of Beverly Hills, Inglewood, West Hollywood, and Hidden Hills.	Trash Monitoring and Reporting Plan and PMRP from Regional Board Executive Officer, and annually thereafter.
4	Installation of Full Capture Systems or other measures to achieve 20% reduction of trash from Baseline WLA[4].	California Department of Transportation, Los Angeles County, Ventura County Watershed Protection District, County of Ventura, and Cities of Agoura Hills, Calabasas, Culver City, El Segundo, Hermosa Beach, Los Angeles, Malibu, Manhattan Beach, Palos Verdes Estates, Rancho Palos Verdes, Redondo Beach, Rolling Hills, Rolling Hills Estates, Santa Monica, Thousand Oaks, Torrance, and Westlake Village.	Four years from effective date of TMDL.
5	Installation of Full Capture Systems or other measures to achieve 40% reduction of trash from Baseline WLA[4].	California Department of Transportation, Los Angeles County, Ventura County Watershed Protection District, County of Ventura, and Cities of Agoura Hills, Calabasas, Culver City, El Segundo, Hermosa Beach, Los Angeles, Malibu, Manhattan Beach, Palos Verdes Estates, Rancho Palos Verdes, Redondo Beach, Rolling Hills, Rolling Hills Estates, Santa Monica, Thousand Oaks, Torrance, and Westlake Village.	Five years from effective date of TMDL.
6	1. Evaluate the effectiveness of Full Capture Systems or other measures to achieve trash WLA, 2. Evaluate BMPs implemented at industrial facilities for effectiveness in achieving plastic pellet WLA, and 3. Reconsider the trash and plastic pellet WLAs, if warranted.	Regional Board.	Five years from effective date of TMDL.
7	Installation of Full Capture Systems or other measures to achieve 60% reduction of trash from Baseline WLA[4].	California Department of Transportation, Los Angeles County, Ventura County Watershed Protection District, County of Ventura, and Cities of Agoura Hills, Calabasas, Culver City, El Segundo, Hermosa Beach, Los Angeles, Malibu, Manhattan Beach, Palos Verdes Estates, Rancho Palos Verdes, Redondo Beach, Rolling Hills, Rolling Hills Estates, Santa Monica, Thousand Oaks, Torrance, and	Six years from effective date of TMDL.

[4] Compliance with percent reductions from the Baseline WLA will be assumed wherever properly-sized full capture systems are installed and properly operated and maintained in corresponding percentages of the conveyance discharging to waterbodies within the Santa Monica Bay Watershed or directly to Santa Monica Bay.

		Westlake Village.	
8	Installation of Full Capture Systems or other measures to achieve 80% reduction of trash from Baseline WLA[4].	California Department of Transportation, Los Angeles County, Ventura County Watershed Protection District, County of Ventura, and Cities of Agoura Hills, Calabasas, Culver City, El Segundo, Hermosa Beach, Los Angeles, Malibu, Manhattan Beach, Palos Verdes Estates, Rancho Palos Verdes, Redondo Beach, Rolling Hills, Rolling Hills Estates, Santa Monica, Thousand Oaks, Torrance, and Westlake Village.	Seven years from effective date of TMDL.
9	Installation of Full Capture Systems or other measures to achieve 100% reduction of trash from Baseline WLA[4].	California Department of Transportation, Los Angeles County, Ventura County Watershed Protection District, County of Ventura, and Cities of Agoura Hills, Calabasas, Culver City, El Segundo, Hermosa Beach, Los Angeles, Malibu, Manhattan Beach, Palos Verdes Estates, Rancho Palos Verdes, Redondo Beach, Rolling Hills, Rolling Hills Estates, Santa Monica, Thousand Oaks, Torrance, and Westlake Village.	Eight years from effective date of TMDL.
10	Compliance with General or Individual Industrial NPDES permit requirements to achieve the plastic pellet WLA.	Permittees of the Industrial Storm Water General Permit (NPDES Permit No. CAS 000001), other general permits, or individual industrial storm water permits for industrial activities with SIC codes that may include, but are not limited to, 282X, 305X, 308X, 39XX, 25XX, 3261, 3357, 373X, 2893, or with the term "plastic" in the facility or operator name, regardless of SIC code.	Eight years from the effective date of TMDL, or 5 years from placement in a permit, whichever is sooner.

Table 14. Minimum Frequency Assessment and Collection Implementation Schedule for Nonpoint Sources[5]

Task No.	Task	Responsible Jurisdiction	Date
1	Submit a TMRP including an MFAC/BMP Program.	National Park Service, California Department of Parks and Recreation, County of Los Angeles, County of Ventura, State Lands Commission for open space and parks, and California Department of Parks and Recreation, Los Angeles County Department of Beaches and Harbors, Cities of Hermosa Beach, Los Angeles, Santa Monica and Redondo Beach for beaches and harbors.	Six months from TMDL effective date. If a plan is not approved by the Executive Officer within 9 months, the Executive Officer will establish an appropriate monitoring plan.
2	Implement the TMRP and the MFAC/BMP Program.	National Park Service, California Department of Parks and Recreation, County of Los Angeles, County of Ventura, State Lands Commission for open space and parks, and California Department of Parks and Recreation, Los Angeles County Department of Beaches and Harbors, Cities of Hermosa	6 months from receipt of letter of approval from Regional Board Executive Officer, or the date a plan is established by the Executive Officer.

[5] Based on annual reports, the Executive Officer may adjust the minimum frequency of assessment and collection as necessary to ensure compliance between the required trash assessment and collection events.

		Beach, Los Angeles, Santa Monica and Redondo Beach for beaches and harbors.	
3	Achieve LA immediately after each collection and assessment event.	National Park Service, California Department of Parks and Recreation, County of Los Angeles, County of Ventura, State Lands Commission for open space and parks, and California Department of Parks and Recreation, Los Angeles County Department of Beaches and Harbors, Cities of Hermosa Beach, Los Angeles, Santa Monica and Redondo Beach for beaches and harbors.	6 months from receipt of letter of approval from Regional Board Executive Officer, or the date a plan is established by the Executive Officer.
4	Submit annual TMRP reports including proposal for revising MFAC/BMP for Executive Officer approval.	National Park Service, California Department of Parks and Recreation, County of Los Angeles, County of Ventura, State Lands Commission for open space and parks, and California Department of Parks and Recreation, Los Angeles County Department of Beaches and Harbors, Cities of Hermosa Beach, Los Angeles, Santa Monica and Redondo Beach for beaches and harbors.	One year from receipt of letter of approval for the Trash Monitoring and Reporting Plan from Regional Board Executive Officer, and annually thereafter.
5	Demonstrate full compliance by achieving LA between required trash collection and assessment events.	National Park Service, California Department of Parks and Recreation, County of Los Angeles, County of Ventura, State Lands Commission for open space and parks, and California Department of Parks and Recreation, Los Angeles County Department of Beaches and Harbors, Cities of Hermosa Beach, Los Angeles, Santa Monica and Redondo Beach for beaches and harbors.	Five years from effective date of TMDL.
6	Reconsideration of Trash TMDL based on evaluation of effectiveness of MFAC/BMP program, if warranted.	Regional Board.	Five years from effective date of TMDL.

G. Reasonably Foreseeable Environmental Impacts from TMDL Implementation

An accompanying CEQA Substitute Environmental Document (SED) analyzes the potential negative environmental impacts of compliance with the Debris TMDL based on the implementation strategies discussed above. According to municipalities implementing previous Trash TMDL requirements by installing structural full capture systems, it was found the most significant environmental impacts result from construction activities associated with installation and maintenance activities. The primary construction impacts are caused by concrete and electrical work, and in some areas, earth work associated with structural improvements. The environmental impacts are resulting from maintaining, removing and disposing trash from structural treatment systems. Both construction and environmental impacts may be mitigated by available technologies.

Regarding cumulative impacts, it is noted that both the construction and maintenance activities are in small, discrete, discontinuous areas over a short duration. Consequently, cumulative impacts are not significantly exacerbated from the sum of individual project impacts. Project level environmental analysis for implementation of structural methods will likely be conducted by municipalities and responsible jurisdictions under notices of exemption. Categorical exemptions will be based on the nature of the projects including:

-Minor alteration of existing public structures involving negligible expansion of an existing facility.
-Modifications of existing storm drain system and addition of environmental protection devices in existing structures with negligible or no expansion of use.
-Modifications to sewers constructed to alleviate a high potential or existing public health hazard.

The analysis concludes that the implementation of this TMDL will result in water quality improvement in Santa Monica Bay, but may be associated with temporary or permanent localized adverse impacts to the environment. While specific projects employed to implement the TMDL may have significant impacts, these impacts may be limited, short-term or mitigated through effective design and scheduling. Under circumstances that none of the alternatives or mitigation measures is available to mitigate the environmental impact caused by implementation of this Debris TMDL, implementing this Debris TMDL would outweigh the unavoidable adverse environmental effects because the minimum foreseeable environmental impacts shall be addressed by project level planning, construction, and operation methods as described in the CEQA SED.

IX. Monitoring

Assessment and monitoring of trash and plastic pellets are key components of the TMDL. The goal of trash and plastic pellet monitoring is to collect representative data across the watershed that can be used to refine Baseline Load and Waste Load Allocations, effectively site and design BMPs, including full capture systems, partial capture systems, or any other structural or non-structural BMPs, and determine compliance with Waste Load and Load

Allocations. Monitoring activities and results, including implementation and effectiveness of BMPs, will be reported to the Regional Board on an annual basis, as described in the Implementation schedule. Responsible jurisdictions will be required to propose and implement a Trash Monitoring and Reporting Plan approved by the Executive Officer.

A. Trash Monitoring

The Trash Monitoring and Reporting Plan will describe the methodologies that will be used to assess and monitor trash in the source areas within and, if applicable, in the vicinity of the Santa Monica Bay. Regional Board staff finds that monitoring protocols prescribed by the SWAMP Rapid Trash Assessment protocol are appropriate for this TMDL. Elements of the Trash Monitoring and Reporting Plan are described below.

- Monitoring Plan. Responsible jurisdictions shall submit a Trash Monitoring and Reporting Plan with the proposed monitoring sites. The TMRP must include, for each proposed monitoring location, maps of the drainage area and storm drains and locations where most trash accumulates on the beaches, in the harbors, and in the vicinity of the bay (for nonpoint sources). The TMRP will be submitted to the Regional Board according the TMDL Implementation Schedule. The Regional Board's Executive Officer will have full authority to review the monitoring plans, to revise the plans, to select among the alternate monitoring sites, and to approve or disapprove the plans.

- Jurisdiction. Allocations will be implemented through stormwater permits, prohibitions, or by Conditional Waivers. For this reason, each responsible jurisdiction must provide the Regional Board a list of entities, if any, located within their geographical boundary that are outside of their jurisdiction, including state or federal lands and facilities.

- Data Collection. Baseline data must be collected during the first two years of implementation. Because the amount of trash deposited into the Santa Monica Bay through storm drains or from nonpoint sources may depend on rainfall patterns and winds, monitoring will include dates in both the rainy season and the dry season. The rainy season is defined as the period from October 15 to April 15.

- Unit of Measure. Data will be reported in a single unit of measure that is reproducible and measures the amount of trash, irrespective of water content (e.g., compacted volume based on a standardized compaction rate, dry weight, etc.). The responsible jurisdictions may select the unit. The unit of measure used during baseline monitoring also will be used during implementation for determining compliance with Waste Load Allocations and Load Allocations.

- Vegetation. The responsible jurisdictions may exclude vegetation from their reported discharge except where there is evidence that the vegetation is the result of the illegal discharge of yard waste. However, all monitoring data must be reported uniformly (either with or without vegetation). If the responsible jurisdictions include vegetation in the discharges reported during baseline monitoring, they will

be obligated to include natural vegetation in their reports of discharge during implementation.

- Disposal of Collected Trash. Trash captured during the monitoring plan must be disposed of in accordance with all applicable laws and regulations.

- Location. Trash monitoring in the source areas and on the shores of the Santa Monica Bay shall focus on visible trash at representative and critical locations and hot spots determined by the responsible jurisdictions and approved by the Executive Officer in the Trash Monitoring and Reporting Plan. Locations for trash assessment shall include, but not be limited to, (1) locations where trash enters the Santa Monica Bay and beaches along the Santa Monica Bay and accumulates in the harbors and shorelines, and (2) areas of recreational access and wildlife habitat. Trash assessment on the water and shorelines shall include the type of trash and amount of trash according to a metric proposed and approved in the Monitoring and Reporting Plan.

- Representative Data. In order to provide representative data to be used in deriving the baseline Waste Load Allocation and baseline Load Allocation, the minimum requirements for the Trash Monitoring and Reporting Plan include:

  - The plan shall provide representative data across the subwatershed.
  - The plan shall provide data in units that are easily reproducible and comparable with data to be collected during the implementation phase.
  - The baseline Waste Load Allocation and baseline Load Allocation may be revised based on data generated from the plan.

- Land Use Areas. Dischargers may propose trash monitoring according to Land Use Areas in the Santa Monica Bay Watershed. Monitoring data can be used to establish specific trash generation rates per land use for siting and design of BMPs.

In addition to the general monitoring requirements, two TMDL monitoring strategies are outlined below for the proposed point and nonpoint compliance options.

1. Monitoring of Point Source Trash Discharges

Monitoring of full capture devices and other structural and/or non-structural BMPs for point sources focuses on the description and quantification of trash collected by the proposed devices and BMPs, and an assessment of their effectiveness in reducing trash. The Monitoring and Reporting Plan will describe how trash collected from full capture devices and other structural and/or non-structural BMPs will be quantified and how trash reductions in the Santa Monica Bay and on the beaches and shorelines will be assessed.

2. Monitoring of Nonpoint Source Trash Discharges

Responsible jurisdictions must identify monitoring locations that are considered “hot spots” within the vicinities surrounding the Santa Monica Bay. The TMRP should describe how proposed monitoring locations will demonstrate that all visible trash on the beaches and

open spaces within the Santa Monica Bay Watershed can be assessed and collected. Responsible jurisdictions must collect 100% of the trash accumulated between MFAC events. The MFAC depends on the composition of land uses along the waterbodies. The detailed MFAC for each specific nonpoint source area is provided in Section VIII.A.2.

The County of Los Angeles, County of Ventura, National Park Service, California Department of Parks and Recreation, and State Lands Commission will monitor open space areas in their respective jurisdictions. California Department of Parks and Recreation, Los Angeles County Department of Beaches and Harbors and the Cities of Hermosa Beach, Los Angeles, Santa Monica, and Redondo Beach will monitor the beaches in their jurisdictions along the Santa Monica Bay. Los Angeles County Department of Beaches and Harbors and the City of Redondo Beach will monitor harbors within their jurisdiction in the Santa Monica Bay.

The reports submitted for Regional Board review must contain information, including but not limited to, dates of inspection, descriptions of trash type, estimates of trash quantity if weighting is not available, and immediate action of trash removal. At least one photo at each designated observation location per assessment and collection event, and as needed, must be taken and attached to the report to support the observation.

B. Plastic Pellet Monitoring

MS4 permittees identified as responsible jurisdictions for point sources of trash in the Santa Monica Bay Debris TMDL and in the existing Malibu Creek and Ballona Creek Trash TMDLs shall prepare a Plastic Pellet Monitoring and Reporting Plan (PMRP) that will be used to monitor the amount of plastic pellets being discharged from the MS4 at critical locations and times, establish triggers for the possible need for increased industrial facility inspections and enforcement of SWPPP requirements for industrial facilities identified as responsible for the plastic pellet WLA, and address possible plastic pellet spills. The PMRP shall include protocols for a timely and appropriate response to possible plastic pellets spills within a Permittee's jurisdictional area, and a comprehensive plan to ensure that plastic pellets are contained.

- Monitoring Plan. Responsible jurisdictions shall submit a Plastic Pellet Monitoring and Reporting Plan that will address monitoring of plastic pellets at all outfalls in the MS4 under their respective jurisdictions. The PMRP shall also include protocols for a timely and appropriate response to possible plastic pellets spills within a Permittee's jurisdictional area, and a comprehensive plan to ensure that plastic pellets are contained. The PMRP will be submitted to the Regional Board according to the TMDL Implementation Schedule. The Regional Board's Executive Officer will have full authority to review, revise, approve, or disapprove the monitoring plans.

- Data Collection. Because the amount of plastic pellets deposited into the Santa Monica Bay through storm drains may depend on rainfall patterns, monitoring will include events at a minimum of once in the rainy season and once in the dry season every year. The rainy season is defined as the period from October 15 to April 15.

- Unit of Measure. The amount of plastic pellets discharged at storm drain outfalls shall be reported in a single unit of measure. The responsible jurisdictions may select the unit. The unit of measure will be used to establish triggers for the possible need for increased industrial facility inspections and enforcement of SWPPP requirements for industrial facilities identified as responsible for the plastic pellet WLA.

- Disposal of Collected Plastic Pellets. Plastic pellets captured during the monitoring plan must be disposed of in accordance with all applicable laws and regulations.

- Location. Plastic pellets will be monitored at the selected outfalls of storm drains within the Santa Monica Bay watershed, where industrial permittees are located.

X. Cost Considerations

Porter-Cologne Section 13241(d) requires staff to consider costs associated with the establishment of water quality objectives. The TMDL does not establish water quality objectives, but is merely a plan for achieving existing water quality objectives. Therefore cost considerations required in Section 13241 are not required for this TMDL.

The purpose of this cost analysis is to provide the Regional Board with information concerning the potential cost of implementing this TMDL and to addresses concerns about costs that have been raised by responsible jurisdictions. This section takes into account a reasonable range of economic factors in fulfillment of the applicable provisions of the California Environmental Quality Act (Public Resources Code Section 21159.)

An evaluation of the costs of implementing this Debris TMDL amounts to evaluating the costs of preventing trash and pellets from being deposited to and accumulating in the Santa Monica Bay. This brief report gives a summary overview of the costs associated with the most likely ways the responsible jurisdictions will achieve the required reduction in discharges via the storm drain system and reduction in accumulation resulting from the potential nonpoint source areas. Such an analysis would be incomplete if it failed to consider the existing cost that presently is transferred to "innocent" downstream communities; there is an unquantified cost to aquatic life within the Santa Monica Bay caused by the existing debris impairments.

Cost of Implementing Trash TMDL

The reference provided by Los Angeles County indicated that it costs more than 4 million dollars to clean trash from 31-miles of beach annually. The city of Long Beach, at the mouth of the Los Angeles River, also spends almost $1 million annually to clean up storm debris accumulated in the Long Beach Harbor. These expenses should be taken into consideration when calculating the potential cost of implementing the Debris TMDL.

The cost of implementing this TMDL will range widely, depending on the method that the responsible jurisdictions select to meet the Waste Load and Load Allocations. Alternatives for implementing the Debris TMDL include enforcement of existing litter

ordinances to achieve the final Waste Load and Load Allocations at minimal cost and installation and maintenance of full capture systems on all MS4 catch basins that discharge to the Santa Monica Bay.

The following discussion consists of general cost analyses for retrofitting all the catch basins in the urbanized portion of the watershed with structural full capture methods and for implementing an MFAC/BMP program. The costs are not additive and should be considered separately depending on the implementation strategy chosen.

1. Catch Basin Inserts

At a cost of approximately $200 - 800 per insert, catch basin inserts are the least expensive structural treatment device in the short term. At the lesser cost estimate of $200 per catch basin insert, it is assumed that responsible jurisdictions would be fully implementing institutional controls. It is assumed that all catch basins will be monitored frequently and used in conjunction with street sweeping.

The 2006 Compliance Report prepared by the County of Los Angeles for the Ballona Creek and Wetland Trash TMDL provides the number of catch basins per high, medium, and low trash generation areas for both the Los Angeles River Watershed and the Ballona Creek Watershed.

As discussed earlier, the areas to the south and east of the Malibu Creek Subwatershed have a high trash generation rate. Therefore, these areas are similar to the high and medium trash generation areas of the Los Angeles River and Ballona Creek Watersheds. The catch basin density for the areas to the south and east of the Malibu Creek Subwatershed was calculated by taking the average of the catch basin densities in high and medium trash generation areas in both the Los Angeles River and Ballona Creek Watersheds. Likewise, the catch basin density in the Malibu Creek Subwatershed and the areas to the north and west of the Malibu Creek Subwatershed was calculated using the average of the catch basin densities in medium and low trash generation areas for the Los Angeles River and Ballona Creek Watersheds.

It was calculated that there are approximately 286 catch basins per square mile in the areas to the south and east of the Malibu Creek Subwatershed, and 170 catch basins per square mile in the Malibu Creek Subwatershed and the areas to the north and west of the Malibu Creek Subwatershed. Since responsible jurisdictions have existing schedules to maintain catch basins as required by MS4 permits, each catch basin may need an additional budget of $100 per year in response to the requirement of this TMDL. The cost of installing catch basin inserts ranges from $200 per catch basin to $800. WLAs require the compliance to be achieved in 8 years, with 5 years for retrofitting catch basins. Table 15 presents the costs of installing catch basin inserts.

Table 15. Cost range for retrofitting catch basin inserts at a cost of $200-$800 per insert. (Dollars in thousands)

Number of years in the program	1	2	3	4	5	6	7	8
Operations and Maintenance (yearly, cumulative)	$550	$1,099	$1,649	$2,198	$2,748	$2,748	$2,748	$2,748
Capital Cost (yearly)	$1,099 - $4,397	$1,099 - $4,397	$1,099 - $4,397	$1,099 - $4,397	$1,099 - $4,397			
Annual Costs per year (Capital + Operation and Maintenance)	$1,649 - $4,946	$2,198 - $5,496	$2,748 - $6,046	$3,298 - $6,595	$3,847 - $7,145	$2,748	$2,748	$2,748

2. Full Capture Vortex Separation Systems (VSS)

The cost of installing a VSS is higher than a catch basin insert, so the number of units which can be installed during any single fiscal year may be limited by funding.

The point source area in this TMDL is approximately 68,539 acres. Table 16 provides capacities and the associated costs of various sizes of VSS units. Staff assumes the cost of yearly servicing of a VSS unit to be $2000.

Table 16. Costs associated with utilizing vortex separation systems (VSS).

Capacity	Acres Treated (average)	Unit Capital Cost	Number of devices needed on urban portion of watershed	Capital costs	Yearly costs for servicing all devices
1 to 2 cfs	5	$12,800	13,707	$175,424,000	$164,460,000
19 to 24 cfs	100	$90,000	685	$61,650,000	$8,220,000

Tables 17 and 18 compare the estimated costs of retrofitting the point source areas with low capacity VSS (1 to 2 cfs) and large capacity VSS (19 to 24 cfs), given that the VSS units will be installed within the first five years after the effective date of this TMDL.

Table 17. Costs associated with low capacity vortex gross pollutant separation systems. (Dollars in thousands)

Number of years in the program	1	2	3	4	5	6	7	8
Units Installed	2,741	2,741	2,741	2,741	2,741			
Operations and Maintenance (yearly, cumulative)	$5,482	$10,964	$16,446	$21,928	$27,410	$27,410	$27,410	$27,410
Capital Cost (yearly)	$35,085	$35,085	$35,085	$35,085	$35,085			
Annual Costs per year (Capital + Operation and Maintenance)	$40,567	$46,049	$51,531	$57,013	$62,495	$27,410	$27,410	$27,410

Table 18. Costs associated with large capacity vortex gross pollutant separation systems. (Dollars in thousands)

Number of years in the program	1	2	3	4	5	6	7	8
Units Installed	137	137	137	137	137			
Operations and Maintenance (yearly, cumulative)	$274	$548	$822	$1,096	$1,370	$1,370	$1,370	$1,370
Capital Cost (yearly)	$12,330	$12,330	$12,330	$12,330	$12,330			
Annual Costs per year (Capital + Operation and Maintenance)	$12,604	$12,878	$13,152	$13,426	$13,700	$13,700	$13,700	$13,700

Outfitting a large drainage area with a small number of large VSS systems may be less costly than using a larger number of small VSS systems. Maintenance costs decrease dramatically as the size of the system increases. Topographical and geotechnical considerations also should come into play when choosing VSS systems or other structural systems or devices.

3. End of Pipe Nets

Because end of pipe nets require attachment to the end of a pipe, the number of locations within a drainage system that can be treated are limited. In addition, these nets cannot be installed on very large channels (7 feet in diameter is the maximum). Thus, the costs shown in Table 19 are given per pipe, and no drainage coverage is given.

Table 19. Sample Costs for End of Pipe Nets.

Pipe Size	Release nets (cost estimates)
End of 3 ft pipe	$10,000
End of 4 ft pipe	$15,000
End of 5 ft pipe	$20,000
In 3 ft pipe network	$40,000
In 4 ft pipe network	$60,000
In 5 ft pipe network	$80,000

Actual costs for implementation of structural BMPs can be optimized through consideration of site specific considerations when selecting the appropriate equipment and methods. Capital costs can also be off set through grants and loans from state and federal agencies, as available.

4. Cost Consideration – Plastic Pellet Monitoring

In order to comply with the Santa Monica Bay Debris TMDL, MS4 Permittees must implement a Regional Board Executive Officer approved Plastic Pellet Monitoring and

Reporting Plan. This section approximates the cost of monitoring at the 40 storm drain outfalls along the Santa Monica Bay beaches.

Responsible jurisdictions may monitor each of the 40 storm drain outfalls twice per year (one dry event, and one wet event per year). Assuming that each event takes one staff person four hours to conduct at a burdened hourly rate of $37.50 per hour, the total cost of implementing the PMRP is $12,000 per year (Table 20).

Table 20. Estimation of costs associated with implementing the plastic pellet monitoring and reporting plan.

Monitoring Events per Year	Hours per Event	Rate	Total Cost per Year
80	4	$37.50	$12,000

5. Cost Consideration – Minimum Frequency Trash Assessment and Collection

This section provides an estimate of costs to comply with the Minimum Frequency of Assessment and Collection program for nonpoint source responsible jurisdictions. The cost estimate is based on the minimum frequency of assessment, collection (including cleanup after critical conditions) and evaluation monitoring recommended in section VIII.A.2.

It is assumed that the personnel for trash assessment and collection will be employed by one of the agencies that provide services to the nonpoint source area of the Santa Monica Bay Watershed. As such, equipment and vehicles are available and costs for these items are assumed to be included in the estimate below. It is also assumed that a single person can conduct the complete critical conditions clean up in eight hours per event, and the morning trash assessment and afternoon evaluation in two hours per event.

An estimation of the total number of hours per year to implement critical conditions cleanup events is provided in Table 21. Critical conditions take into account the 27 weekends between April 15 and October 15, plus four major storms. These 31 critical conditions can be directly applied to the City of Santa Monica. For LACDBH, this number is multiplied by the 14 beaches along the Santa Monica Bay that fall within their jurisdiction. In addition, since LACDBH also manages Marina del Rey Harbor, the 31 critical conditions is multiplied by the eight basins in the harbor. Similarly, since the City of Redondo Beach manages King Harbor, the 31 critical conditions are multiplied by five areas in the harbor. For the five other open space nonpoint sources, the critical conditions only take into account the four major storm events.

Table 21. Estimation of Critical Condition hours for Implementing Minimum Frequency of Assessment and Collection Program

Jurisdiction	Critical Conditions (per year)	Hours per Event	Total Hours
Beaches			
Los Angeles County Department of Beaches and Harbors (jointly with other agencies and jurisdictions for specific beaches, as defined in Section V, Table 12)	434	8	3,472

City of Santa Monica (jointly with other agencies and jurisdictions for specific beaches, as defined in Section V, Table 12)	31	8	248
Harbors			
Los Angeles County Department of Beaches and Harbors	248	8	1,984
City of Redondo Beach	155	8	1,240
Open Space/Parks			
County of Los Angeles, County of Ventura, National Park Service, California Department of Parks and Recreation, State Lands Commission	20	8	160

Currently, LACDBH and the City of Santa Monica conduct daily cleanup events along the beaches of the Santa Monica Bay. As a result, the cost for these jurisdictions to comply with the MFAC program will not include the current practices of daily cleanup, and will only include the additional costs of trash compliance assessment and afternoon evaluation. The estimated hours needed to conduct assessment, collection, and evaluation events that are required through this TMDL are summarized in Table 22, below. For beaches managed by LACDBH, the number of MFAC events per year were calculated by adding the 14 compliance assessments per year to the twelve afternoon evaluations per year, and multiplying this by the three locations per beach that will be assessed/evaluated at each event. For the harbors managed by LACDBH and the City of Redondo Beach, the MFAC events were calculated by adding the four morning assessments per year to the two afternoon evaluations per year, and multiplying this by the 39 locations within the harbors (13 basins/areas x 3 locations).

Table 22. Estimation of Assessment, Collection, and Evaluation hours for implementing MFAC program

Jurisdiction	MFAC Description	MFAC (per year)	Hours per Event	Total Hours
Beaches				
County of Los Angeles Department of Beaches and Harbors	1. Assessment once per year per beach (at three sites per beach) in the morning, immediately following cleanup event. 2. Evaluation once per year at 12 beaches (at three sites per beach) at a given time in the afternoon.	78	2	156
City of Santa Monica	1. Assessment four times per year at Santa Monica Beach (at 3 sites) in the morning. 2. Evaluation four times per year at Santa Monica Beach (at 3 sites) in the afternoon.	24	2	48
Harbors				
Los Angeles County Department of Beaches and Harbors and City of Redondo Beach	1. Assessment four times per year at harbors (at 3 sites) in the morning 2. Evaluation two times per year at harbors (at 3 sites) in the afternoon.	234	2	468
Open Space/Parks				
County of Los Angeles, County of Ventura, National Park Service, California Department of Parks and Recreation, State Lands Commission	1. Assessment once per month immediately following cleanup event.	60	2	120

The costs per year to implement the Santa Monica Bay Debris TMDL are summarized in Table 23. Assuming a burdened hourly rate of $37.50 per hour, the estimated annual costs to conduct the Minimum Frequency of Assessment and Collection program is approximately $296,100 for the Santa Monica Bay Watershed.

Table 23. Costs per year from implementing MFAC Program

Jurisdiction	Critical Condition Hours/yr	Assessment and Collection Hours/yr	Total Hours/yr	Rate	Total Cost/yr
Los Angeles County Department of Beaches and Harbors	5,456	444	3,628	$37.50	$221,250
City of Santa Monica	248	48	296	$37.50	$11,100
City of Redondo Beach	1,240	180	1,420	$37.50	$53,250
County of Los Angeles, County of Ventura, National Park Service, California Department of Parks and Recreation, State Lands Commission	160	120	280	$37.50	$10,500
Total					$296,100

6. Cost Comparison

A comparison of costs between strategies based on catch basin inserts (CBIs), low capacity VSS, high capacity VSS, and enforcement of litter laws is presented in Table 24. This comparison was completed previously for a trash TMDL in the Los Angeles River watershed. Staff assumes the relative magnitude of the costs for the different options is applicable for the Santa Monica Bay Debris TMDL, with an additional cost resulting from the minimum frequency of trash assessment and collection program.

Table 24. Cost Comparison (amounts in millions)

	CBI only	Low capacity VSS Units	Large capacity VSS Units	Plastic Pellet Monitoring	Minimum Frequency Trash Assessment and Collection	Enfo Lit
Cumulative capital costs over 8 years	$5.5 – $22.0	$175.4	$61.7	$0	$0	
Cumulative maintenance and capital costs after 8 years	$22.0 – 38.5	$339.9	$69.9	.012	$0.30	
Annual servicing costs after full implementation	$2.7	$27.4	$1.37	.012	$0.30	

Trash abatement in the Santa Monica Bay Watershed will differ depending on the options selected by the responsible jurisdictions.

[6] Revenues from fines assessed to offset increased law enforcement cost. The cost of a database system used to calculate trash discharges estimated to be less than $250,000.

XI. Bibliography

Allison, R.A., Chiew, F.H.S., and McMahon, T.A. (1998) A Decision-Support-System for Determining Effective Trapping Strategies for Gross Pollutants. Cooperative Research Centre for Catchment Hydrology. Victoria.

Allison, R.A., Walker, T.A., Chiew, F.H.S., O'Neill, I.C., McMahon, T.A. (1998) From Roads to Rivers, Gross Pollutant Removal From Urban Waterways. Cooperative Research Centre for Catchment Hydrology. Victoria.

California Department of Fish and Game, California Natural Diversity Database, updated October 2006. Http://www.dfg.ca.gov/bdb/html/cnddb_info.html Original Access November 15, 2006.

California State Water Resources Control Board, Environmental Protection Agency, Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program, May 2004.

California Water Boards. (2007) A Rapid Trash Method Applied to Waters of the San Francisco Bay Region: Trash Measurement in Streams. Surface Water Ambient Monitoring Program.

Danza, Jim. (1994) Water Quality and Beneficial Use Investigation of the Los Angeles River: Prospects for Restored Beneficial Uses. Masters Thesis, California State University. Fullerton.

Durrum, Emmett: The Control of Floating Debris in an Urban River. In Marine Debris: Sources, Impacts, and Solutions, Coe, James and Rogers, Donald, Eds. New York: Springer-Verlag, 1997.

Garrett, K.L. (1993) The Biota of the Los Angeles River. Los Angeles County Natural History Museum.

Laist, D.W., and Liffmann, M., 2000. Impacts of Marine Debris: Research and Management Needs. Issue papers of the International Marine Debris Conference. Aug. 6-11, 2000. Honolulu, HI, pp16-29.

G.L. Lattin, C.J. Moore, A.F. Zellers, S.L. Moore, S.B. Weisberg. A comparison of neustonic plastic and zooplankton at different depths near the southern California shore, 2004.

Long Beach, Memorandum from Geoffrey Hall, Parks, Recreation and Marine, to Ed Putz, City Engineer.

Los Angeles County, Department of Public Works, Precipitation Report at Munz Valley Ranch for Water Year from October 1, 2004 through September 30, 2005.
Http://www.ladpw.org/wrd/report/0405/precip. Original Access on October 26, 2006

Los Angeles County, An Ordinance Amending Title 20 – Utilities of the Los Angeles County Code, Adopted by Board of Supervisors on January 9, 2007.

Los Angeles Regional Water Quality Control Board, Conditional Waiver of Waste Discharge Requirements fro Discharges from Irrigated Land within the Los Angeles Region, 2005

Los Angeles Regional Water Quality Control Board, State of the Watershed – Report on Surface Water Quality, The Santa Clara River Watershed, April 2006.

Los Angeles Regional Water Quality Control Board, Water Quality Control Plan – Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties, June 1994.

Lund, L.J., Anderson, M.A., and Armenia, C. (December 1994), Evaluation of Water Quality for Selected Lakes in the Los Angeles Hydrologic Basin, Department of Soil and Environmental Sciences, University of California, Riverside.

Moore, C.J. (Algalita Marine Research Foundation), Moore, S.L., Lee caster, M.K., and Weisberg, S.B.(Southern California Coastal Water Research Project) Marine Debris in the North Pacific Gyre, 1999, with a Biomass Comparison of Teutonic Plastic and Plankton. (In preparation.)

Moore, S. L., D. Gregorio, M. Carrion, S. B. Weisberg, and M. K. Lee caster. Composition and distribution of beach debris in Orange County, California. In: S.B. Weisberg (ed.), Southern California Coastal Water Research Project Annual Report 1999-2000. Southern California Coastal Water Research Project. Westminster, CA.

Moore, S.L. and Allen, M.J. (2000) Distribution of Anthropogenic and Natural Debris on the Mainland Shelf of the Southern California Bight. Marine Pollution Bulletin 40:83-88.

Pennsylvania State, Department of Environmental Protection, Lake Erie Cleanup Inventories, Clears 7,700 Pounds of Trash from Shoreline, October 5, 2006. Http://www.depweb.state.pa.us/news/cwp

Rubik, C.A., Johnson, S.W., and Cole, C.A. (1997) Distribution, Type Accumulation, and Source of Marine Debris in the United States, 1989-1993. Pp. 35-47 in: Coe, J.M., and Rogers, D.B. (eds.), Marine debris: Sources, impacts, and solutions. Springer-Verlag. New York, NY.

Santa Monica Bay Restoration Project, Santa Monica Bay Restoration Plan, 1994.

Santa Monica Bay Restoration Commission, http://www.santamonicabay.org/smbay/ProblemsSolutions/HabitatsLivingResources/SandyBeaches/tabid/76/Default.aspx, 2010.

Santa Monica Baykeeper, http://www.smbaykeeper.org/kelp.html, 2010.

Saint, P.K., Hanes, T.L., Lloyd, W.J., Waterbodies, Wetlands and their Beneficial Uses in the Los Angeles Region (July 1993), California State University, Fullerton.

Sheavly, S.B. 2007. "National Marine Debris Monitoring Program: Final Program Report, Data Analysis and Summary." Prepared for U.S. Environmental Protection Agency by Ocean Conservancy, Grant Number X83053401-02. 76 pp.

Signal Hill, Comments on the Los Angeles River Trash TMDL and CEQA Document, August 21, 2006.

US Environmental Protection Agency (US EPA) (1992) Plastic Pellets in the Aquatic Environment: Sources and Recommendations. Washington D.C. EPA 842-B-92-010.

US Environmental Protection Agency (US EPA) 2001. Draft Assessing and Monitoring Floatable Debris.

US Environmental Protection Agency (US EPA) 2002. The definition, Characterization and Sources of Marine Debris. Unite 1 of Turning the Tide on Trash, a Learning Guide on Marine Debris.

US Environmental Protection Agency (US EPA) 2006, Region 9 Website, California Nonpoint Source Program, http://www.epa.gov/region09/water/nonpoint/cal/index.html

Walker, T.A., Allison, R.A., Wong, T.H.F., and Wooton, R.M (1999) Removal of Suspended Solids and Associated Pollutants by a CDS Gross Pollutant Trap. Cooperative Research Centre for Catchment Hydrology. Victoria.

Walker, T.A., Wong, T.H.F. (1999) Effectiveness of Street Sweeping for Stormwater Pollution Control, Technical Report, Report 99/8, December 1999. Cooperative Research Centre for Catchment Hydrology. Victoria.

Appendix I Land Use Classification

The land use classification was developed by Aerial Information Systems as a modified Anderson Land Use Classification and originally included 104 categories. The land use coverages were donated for GIS library use by Southern California Association of Governments (SCAG), and show land use for 2005. The coverages were map-joined into a single coverage by Teale Data Center. The Regional Board layers were aggregated from the TDC coverage into the land uses shown above.

Critical land uses were mapped regardless of resolution limits. Critical land use units below 1 acre in size were mapped as 1-acre units.

Land Uses	Description and subcategories of Each Land Use
High Density Residential	High density single family residential and all multi family residential, mobile homes, trailer parks and rural residential high density.
Low Density Residential	Under 2 units per acre.
Public Facilities	government centers, police and sheriff stations, fire stations, medical health care facilities, religious facilities large enough to be distinguished on an aerial photograph, libraries, museums, community centers, public auditoriums, observatories, live indoor and outdoor theaters, convention centers which were built prior to 1990, communication facilities, and utility facilities (electrical, solid waste, liquid waste, water storage and water transfer, natural gas and petroleum)
Education	Preschools and daycare centers, elementary schools, high schools, colleges and universities, and trade schools, including police academies and fire fighting training schools.
Transportation	Airports, railroads, freeways and major roads (that meet the minimum mapping resolution of 2.5 acres), park and ride lots, bus terminals and yards, truck terminals, harbor facilities, mixed transportation and mixed transportation and utility.
Mixed Urban	Mixed commercial, industrial and/or residential, and areas under construction or vacant in 1990.
Open Space and Recreation	Golf courses, local and regional parks and recreation, cemeteries, wildlife preserves and sanctuaries, botanical gardens, beach parks.
Agriculture	Orchards and vineyards, nurseries, animal intensive operations, horse ranches.
Water	Open water bodies, open reservoirs larger than 5 acres, golf course ponds, lakes, estuaries, channels, detention ponds, percolation basins, flood control and debris dams.

Appendix II Surface Areas of Land Uses

This table shows the square mileage for "high density residential", "low density residential", "commercial" (Comm.), "industrial" (Ind), "public facilities", "education" (Ed), "military", "transportation", "mixed urban", "open space" (Open), "agriculture", "water", and "recreation" (Rec) land uses for every city and incorporated areas in the watershed. The "water" land use of water is itself a nonpoint source of trash, and will therefore receive a combined Load Allocation. For cities that are only partially located on the watershed, the square mileage indicated is for the portion located in the watershed.

Square mileage estimated for each land use for cities in the watershed, and for unincorporated areas.

Owner	High Density Residential	Low Density Residential	Comm	Ind	Public Facilities	Ed	Military	Trans-portation	Mixed Urban	Open	Agricul-ture	Water	Rec	Total for all classes
Agoura Hills	0.065	0.493	0.145	0.006	0.005	0.002	0.000	0.063	0.054	0.794	0.034	0.015	0.020	1.696
Calabasas	0.082	0.127	0.000	0.000	0.000	0.000	0.000	0.000	0.047	2.314	0.007	0.000	0.011	2.588
CA Dept of Parks & Rec	0.072	0.051	0.041	0.002	0.021	0.004	0.000	0.000	0.000	18.374	0.004	0.001	0.673	19.243
Culver City	0.016	0.000	0.048	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.065
El Segundo	1.147	0.000	0.235	1.665	0.086	0.092	0.000	0.023	0.005	0.088	0.000	0.000	0.159	3.501
Hermosa Beach	0.988	0.000	0.177	0.011	0.032	0.027	0.000	0.000	0.000	0.000	0.000	0.000	0.177	1.411
Los Angeles	11.738	1.979	0.732	0.214	0.614	0.667	0.047	3.195	0.069	13.829	0.026	0.067	1.851	35.027
Los Angeles County	2.044	3.744	0.197	0.004	0.222	0.362	0.000	0.004	0.156	47.034	0.719	0.081	0.209	54.775
Malibu	0.911	1.947	0.124	0.003	0.022	0.041	0.000	0.011	0.037	5.743	0.114	0.000	0.176	9.130
Manhattan Beach	2.496	0.000	0.259	0.000	0.052	0.183	0.008	0.010	0.012	0.011	0.000	0.000	0.270	3.301
National Park Service	0.003	0.018	0.000	0.000	0.024	0.000	0.000	0.000	0.000	11.710	0.004	0.000	0.005	11.765
Palos Verdes Estates	2.252	0.553	0.020	0.000	0.024	0.146	0.000	0.051	0.003	0.983	0.000	0.000	0.311	4.343
Rancho Palos Verdes	3.815	0.539	0.096	0.000	0.058	0.127	0.021	0.088	0.080	3.719	0.057	0.000	0.625	9.225
Redondo Beach	2.995	0.000	0.418	0.023	0.228	0.227	0.000	0.016	0.005	0.027	0.036	0.008	0.221	4.204
Rolling Hills	0.003	0.350	0.000	0.000	0.009	0.016	0.000	0.011	0.000	0.276	0.000	0.000	0.000	0.665

Rolling Hills Estates	0.389	0.000	0.000	0.000	0.000	0.013	0.000	0.000	0.000	0.036	0.005	0.000	0.022	0.465
Santa Monica	4.773	0.090	1.288	0.348	0.136	0.288	0.000	0.369	0.035	0.051	0.000	0.000	0.306	7.685
Simi Valley	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.000	0.000	0.000	0.008
State Land Commission	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.375	0.000	0.000	0.000	1.377
Thousand Oaks	1.394	0.445	0.610	0.054	0.031	0.110	0.000	0.087	0.031	4.304	0.043	0.141	0.198	7.447
Torrance	2.586	0.001	0.161	0.035	0.043	0.177	0.000	0.000	0.000	0.053	0.044	0.000	0.155	3.255
Ventura County	0.225	0.747	0.004	0.013	0.005	0.000	0.000	0.004	0.115	7.943	2.349	0.223	0.364	11.992
Westlake Village	1.212	0.078	0.325	0.114	0.070	0.058	0.000	0.119	0.035	2.515	0.000	0.326	0.217	5.069
Totals	**39.204**	**11.164**	**4.882**	**2.492**	**1.683**	**2.539**	**0.076**	**4.052**	**0.684**	**121.188**	**3.440**	**0.861**	**5.970**	**198.236**

Appendix III Definitions

The definitions of terms as used in this TMDL are provided as follows:

Beneficial Uses. Beneficial Uses form the cornerstone of water quality protection under the Basin Plan. Once beneficial uses are designated, appropriate water quality objectives can be established and programs that maintain or enhance water quality can be implemented to ensure the protection of beneficial uses. The designated beneficial uses, together with water quality objectives (referred to as criteria in federal regulations) form water quality standards. Such standards are mandated for all waterbodies within the state under the California Water Code. In addition, the federal Clean Water Act mandates standards for all surface waters, including wetlands. Beneficial uses for waterbodies in the Malibu Creek Watershed are listed and defined below:

Municipal and Domestic Supply (MUN)
Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.

Industrial Service Supply (IND)
Uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, grabel washing, fire protection, or oil well re-pressurization.

Ground Water Recharge (GWR)
Uses of water for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.

Navigation (NAV)
Uses of water for shipping, travel, or other transportation by private, military, or commercial vessels.

Water Contact Recreation (REC-1)
Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs.

Non-contact Water Recreation (REC-2)
Uses of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.

Commercial and Sport Fishing (COMM)
Uses of water for commercial or recreational collection of fish, shellfish, or other organisms including, but not limited to, uses involving organisms intended for human consumption or bait purposes.

Warm Freshwater Habitat (WARM)
Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

Cold Freshwater Habitat (COLD)

Estuarine Habitat (EST)
Uses of water that support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds).

Marine Habitat (MAR)
Uses of water that support marine ecosystems including, but not limited to, preservation or enhancement of marine habitats, vegetation such as kelp, fish, shellfish, or wildlife (e.g., marine mammals, shorebirds).

Preservation of Biological Habitats (BIOL)
Uses of water that support designated areas or habitats, such as Areas of Special Biological Significance (ASBS), established refuges, parks, sanctuaries, ecological reserves, or other areas where the preservation or enhancement of natural resources requires special protection.

Migration of Aquatic Organisms (MIGR)
Uses of water that support habitats necessary for migration, acclimatization between fresh and salt water, or other temporary activities by aquatic organisms, such as anadromous fish.

Wildlife Habitat (WILD)
Uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

Rare, Threatened, or Endangered Species (RARE)
Uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened, or endangered.

Spawning, Reproduction, and/or Early Development (SPWN)
Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.

Shellfish Harvesting (SHELL)
Uses of water that support habitats suitable for the collection of filter-feeding shellfish (e.g., clams, oysters, and mussels) for human consumption, commercial, or sports purposes.

Wetland Habitat (WET)
Uses of water that support wetland ecosystems, including, but not limited to, preservation or enhancement of wetland habitats, vegetation, fish, shellfish, or wildlife, and other unique wetland functions which enhance water quality, such as providing flood and erosion control, stream bank stabilization, and filtration and purification of naturally occurring contaminants.

Best Management Practices (BMPs). BMPs are the practice or combination of practices that are determined to be the most effective, practicable means of preventing or reducing the amount of pollution generated by point and nonpoint sources to a level compatible with water quality goals (including technological, economic, and institutional considerations). BMPs are defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. In this TMDL, two general categories of structural BMPs and non-structural BMPs are discussed as possible means to reach "zero" trash goal.

Full Capture Device. A full capture system is any single device or series of devices that traps all particles retained by a 5 mm mesh screen and has a design treatment capacity of not less than the peak flow rate Q resulting from a one-year, one-hour storm in the subdrainage area. Rational equation is used to compute the peak flow rate: $Q = C \times I \times A$, where Q = design flow rate (cubic feet per second, cfs); C = runoff coefficient (dimensionless); I = design rainfall intensity (inches per hour), and A= subdrainage area (acres).

Baseline Load Allocation. The Baseline Load Allocation is analogous to the Baseline Waste Load Allocation for point sources, instead it is for nonpoint sources. Baseline Load Allocation is derived from the existing data, i.e. trash types and quantities, collected by municipalities for various land uses. The progressive reductions in the Load Allocation will be determined based on the Baseline Load Allocation.

Baseline Waste Load Allocation. The Baseline Waste Load Allocation is the Waste Load Allocation assigned to a responsible jurisdiction before reductions are required. The progressive reductions in the Waste Load Allocations could be based on a percentage or variable percentages of the Baseline Waste Load Allocation. The Baseline Waste Load Allocation was calculated based on the annual average amount of trash discharged to the storm drain system from a representative sampling of land use areas, as determined during the Trash Monitoring and Reporting Plan.

Monitoring Entity. The Monitoring Entity is the responsible jurisdiction or one of multiple responsible jurisdictions and/or co-responsible jurisdictions that has been authorized by all the other affected responsible jurisdictions or co-responsible jurisdictions to conduct baseline monitoring on their behalf.

Nonpoint Source. It refers to diffuse, widespread sources of pollution. These sources may be large or small, but are generally numerous throughout a watershed. Nonpoint Sources include but are not limited to urban, agricultural, or industrial areas, roads, highways, construction sites, communities served by septic systems, recreational boating activities, timber harvesting, mining, livestock grazing, as well as physical changes to stream channels, and habitat degradation. NPS pollution can occur year round any time rainfall, snowmelt, irrigation, or any other source of water runs over land or through the ground, picks up pollutants from these numerous, diffuse sources and deposits them into rivers, lakes, and coastal waters or introduces them into ground water.

Responsible jurisdiction. The term "responsible jurisdiction" refers to any responsible jurisdiction or co-responsible jurisdiction of a stormwater permit.

Point Source. The term “point Source” means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural storm water discharges and return flows from irrigated agriculture.

Plastic Pellets. A plastic resin pellet that is the preproduction or raw material that is used to manufacture plastics. Plastic pellets are usually less than 5mm in diameter.

Standard Industrial Classification Codes. Four digit numerical codes assigned by the U.S. government to business establishments to identify the primary business of the establishment.

Trash. In this document, we are defining “trash” as man-made litter, as defined in California Government Code Section 68055.1(g):

> “Litter means all improperly discarded waste material, including, but not limited to, convenience food, beverage, and other product packages or containers constructed of steel, aluminum, glass, paper, plastic, and other natural and synthetic materials, thrown or deposited on the lands and waters of the state, but not including the properly discarded waste of the primary processing of agriculture, mining, logging, sawmilling or manufacturing."

For purposes of this TMDL, we will consider trash to consist of litter and particles of litter, including cigarette butts. These particles of litter are referred to as “gross pollutants” in European and Australian scientific literature. This definition excludes sediments, and it also excludes oil and grease, and vegetation, except for yard waste that is illegally disposed of in the storm drain system. Additional TMDLs for sediments[7] and oil and grease may be required at a later date.

[7] Sediments which may be addressed in a separate TMDL are natural particulate matters such as silt and sand. Sediments result from erosion and are deposited at the bottom of a stream. Sediments do not refer to the decomposition of settleable litter into small particulate matters, which this TMDL is trying to prevent.

2511 Wood Household Furniture, Except Upholstered
2512 Wood Household Furniture, Upholstered
2514 Metal Household Furniture
2515 Mattresses, Foundations, and Convertible Beds
2517 Wood Television, Radio, Phonograph, and Sewing Machine Cabinets
2519 Household Furniture, NEC
2521 Wood Office Furniture
2522 Office Furniture, Except Wood
2531 Public Building and Related Furniture
2541 Wood Office and Store Fixtures, Partitions, Shelving, and Lockers
2542 Office and Store Fixtures, Partitions, Shelving, and Lockers, Except Wood
2591 Drapery Hardware and Window Blinds and Shades
2599 Furniture and Fixtures, NEC
2821 Plastics Materials, Synthetic and Resins, and Nonvulcanizable Elastomers
2822 Synthetic Rubber
2823 Cellulosic Manmade Fibers
2824 Manmade Organic Fibers, Except Cellulosic
2893 Printing Ink
3052 Rubber and Plastics Hose and Belting
3053 Gaskets, Packing, and Sealing Devices
3081 Unsupported Plastics Film and Sheet
3082 Unsupported Plastics Profile Shapes
3083 "Laminated Plastics Plate, Sheet, and Profile Shapes"
3084 Plastics Pipe
3085 Plastics Bottles
3086 Plastics Foam Products
3087 Custom Compounding of Purchased Plastics Resins
3088 Plastics Plumbing Fixtures
3089 "Plastics Products, NEC (plastics sausage casings)"
3089 Plastics Products, NEC
3261 Vitreous China Plumbing Fixtures and China and Earthenware Fittings and Bathroom Accessories
3357 Drawing and Insulating of Nonferrous Wire
3731 Ship Building and Repairing
3732 Boat Building and Repairing (boat building)
3911 Jewelry, Precious Metal
3914 Silverware, Plated Ware, and Stainless Steel Ware
3915 Jewelers Findings and Materials and Lapidary Work
3944 Games, Toys, and Children's Vehicles, Except Dolls and Bicycles (metal tricycles)
3949 Sporting and Athletic Goods, NEC
3952 Lead Pencils and Art Goods
3961 Costume Jewelry and Costume Novelties, Except Precious Metal (except cuff links)
3993 Signs and Advertising Specialties (screen printing purchased advertising specialties)
3996 Linoleum, Asphalted-Felt-Base, and Other Hard Surface Floor Coverings, NEC

3999 Manufacturing Industries, NEC (burnt wood articles, matches, plastic products, hair clippers for humans, tape measures, flocking metal products, beauty and barber shop equipment, lamp shades or paper or textile, electric hair clippers, beauty and barber chairs, fur dressing and finishing)