Area of Special Biological Significance 24
Draft Pollution Prevention Plan For
The County of Los Angeles and City of Malibu

Submitted to:

State Water Resources Control Board
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EXECUTIVE SUMMARY

Background

The Laguna Point to Latigo Point Area of Special Biological Significance (ASBS), also referred to as ASBS 24, was established in 1974 by the State Board to preserve sensitive marine habitat (SWRCB, 1979). It stretches 24 miles, contains 11,842 marine acres, and is the largest ASBS along the mainland of Southern California. A wide range of sandy substrate, rocky reef, and coastal pelagic species can be found within ASBS 24. Figure ES-1-1 shows a small portion of ASBS 24 east of Point Dume.

Figure ES-1-1. ASBS 24 Looking East Across Dume Cove

Since 1983, the California Ocean Plan (Ocean Plan) has prohibited the discharge of waste into ASBS along the California Coast, unless the State Water Resources Control Board (State Board) grants an exception to dischargers. The southern and central portions of ASBS 24 that are located in Los Angeles County (County) are subject to direct discharges from roads, landscape runoff, homes, and small businesses. In general, the near-coast storm water runoff along ASBS 24 within the County is conveyed through storm drain systems before it is discharged at multiple locations along the beach. There are several small drain systems associated with private residence that also have the potential to discharge storm water runoff along the beach. In 2004, the City of Malibu (City), on its own behalf, and the County and the Los Angeles County Flood Control District (District) on behalf of the County and District requested an exception for storm water discharges to ASBS 24 from the State Board. The State Board received applications from numerous other applicants for an exception to the Ocean Plan. In 2012, the State Board adopted a General Exception.

The General Exception includes a Special Protections attachment which specifies prohibited discharges and other requirements the discharger covered under the General Exception must comply with. For ASBS 24, the County, District, and the City were included in the list of responsible entities and required to prepare a draft and final ASBS Pollution Prevention Plan for discharges of storm water from sources not regulated under the National Pollutant Discharge Elimination System (NPDES) permit (SWRCB, 2012a). This Pollution Prevention Plan has been prepared by the County, District, and City (collectively the Parties) in accordance with the

General Exception. The Parties have prepared a Compliance Plan, under a separate cover, to evaluate sources regulated under the NPDES permit that include outfalls that have associated storm networks that drain significant areas and are entirely or partially maintained by an agency. These regulated sources coincide with conveyances that are equal to or greater than 18 inches in size that discharge directly to the ASBS shoreline.

Potential Discharge Locations

The SWRCB prepared a Program Final Environmental Impact Report that included, as an appendix, a list of ASBS drainages (SWRCB, 2012b). This list includes a total of 463 potential discharge sources associated with ASBS 24 that are composed of small drains and areas where sheet flow is directed (e.g., parking lot). Of these 463 potential sources, the SWRCB list identified the responsible party as "Los Angeles County" for 153 sources and the "City of Malibu" for 134 sources. The remaining potential sources are identified as the responsibility of "private or other public agencies" (176).

The listed sources are referred to throughout this Plan as potential sources based on the possibility that some of the drains may no longer be in service or that some of the listed sources are configured to not discharge to the receiving water, even during large storm events (e.g., terminate in sandy beach upland and far from the receiving water).

The SWRCB identifies the County and City as responsible party for numerous potential discharge sources that are not within their jurisdiction or are drains owned by others (private or other public agency). The SWRCB further identifies many drains as "private or other public agencies" that should correctly be identified as "private or undetermined ownership". A complete summary of the proposed corrections to the SWRCB-listed potential discharge sources is provided in the main body of this Plan on Table 2-1. Table ES-1 provides a summary of the County and private or undetermined ownership potential discharge sources within the ASBS 24 watershed. Figure ES-1-2 shows the locations of the potential nonpoint sources corrected as discussed in this Plan.

Table ES-1. Summary of Potential Discharge Sources

Responsible Party	Location	Number of Potential Sources
Los Angeles County	Nicholas Canyon Beach	9
	Zuma Beach	17
	Total County	**26**
Private or Undetermined Ownership	Nicholas Canyon Beach Area	53
	El Pescador Beach Area	19
	La Piedra Beach Area	41
	El Matador Beach Area	31
	Trancas/Broad Beach	61
	Westwards	23
	Point Dume Natural Reserve	36
	Paradise Cove	15
	Escondido Beach	104
	Total Private or Undetermined Ownership	**383**
Total		**409**

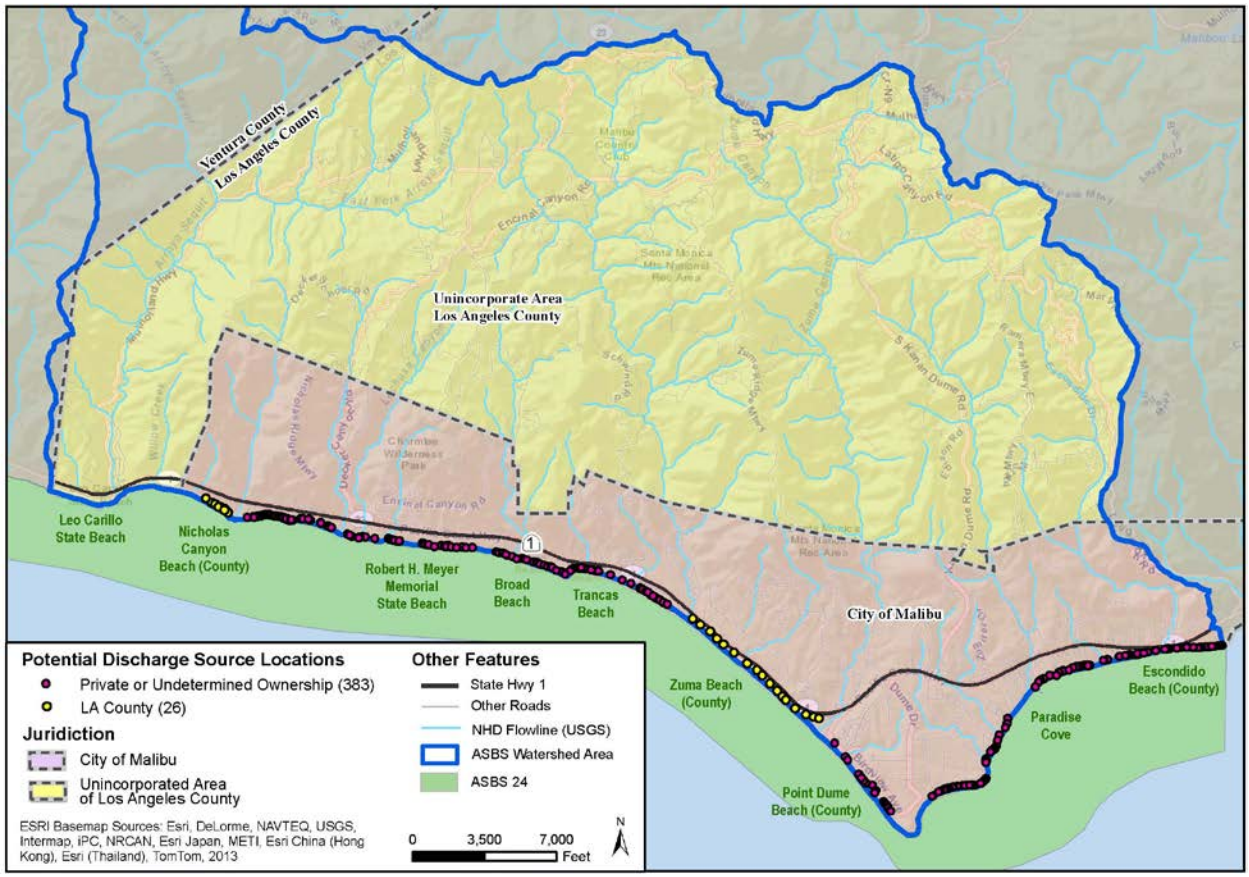

Figure ES-1-2. ASBS-24 Potential Discharge Source Locations

County Potential Discharge Sources

The majority of the County potential discharge sources are associated with beach parking lots. Street sweeping machines are used at County beach parking lots daily during the work week (i.e., performed five times a week). County beaches are classified as open space/recreation land use. In the case of Zuma County Beach, the discharge of parking lot sheet flow is directed into beach sand approximately 200 ft., on average, from the ocean water. Similarly, at Nicholas Canyon County Beach, the small drain that conveys flows from the parking lot ends in a sandy area above the ocean water with about 15 ft. horizontal separation.

Four identified potential discharge sources at Nicholas Canyon County Beach have an outfall of undetermined ownership and originate from residential lots located upland from the beach. These non-point source discharges terminate in the beach sand.

Private or Undetermined Ownership Potential Discharge Sources

A total of 383 identified potential discharge sources originate from private residential properties or other properties (e.g. park lands) and terminate along the coastline, typically at the bottom of the bluffs in either rocky or sandy beach areas. In the areas where residences have been constructed above bluffs, such as Nicholas Canyon and Westward County Beaches; El Pescador,

La Piedra, El Matador, and Point Dume State Beaches; and Paradise Cove, the majority of the drains appear to be designed to convey storm water runoff from single parcels down the bluffs to the shoreline during wet weather. Some drains were observed to be designed to drain groundwater seepage along the bluffs. In areas where properties are located near sea level elevation and protected by rock revetment (e.g., Broad Beach, Escondido Beach), the drains, in general, appear to be designed to convey flows from rain gutter downspouts and hardscape drains during wet weather to prevent bluff erosion due to sheet flow. Some drains may also originate from property owned by lands conservancy and park type agencies.

Pollution Prevention Plan Map

A Pollution Prevention Plan Map for the ASBS 24 watershed area is included in Appendix A. This map shows the 409 identified potential sources of discharge to the ASBS 24 that are either County or private ownership. The private drains originate from privately owned parcels located within the City jurisdictional boundary. Section 2.5 contains a detailed description on the original source of this list of locations. The Pollution Prevention Plan map also shows the storm water conveyances and other storm drain features associated with surface drainage of storm water runoff, including catch basins, inlets/outlets, outfalls, storm drain lines, channels, and creeks. The map identifies core monitoring stations (point sources) and shows the location of other point sources regulated under the NPDES permit (outfalls $\geq$ 18 inches) that are private, state, or federal and not monitored by the Parties. Drainage areas for the core monitoring stations, watershed sub-basins, and flow directions within these sub-basins are depicted, as well as the overall ASBS 24 watershed area. The map also includes the locations of waste and hazardous material storage areas, sewage conveyances and treatment facilities, landslide zones, and roads. Jurisdictional boundaries for the unincorporated area of the County, the City, and state and federal lands within these areas are shown. The Plan provides information regarding the Pollution Prevention Plan Map datasets and the procedures for updating applicable GIS files and the map.

Dry Weather Requirement

The General Exception prohibits all non-authorized non-storm water (dry weather) discharges into the ASBS. Dry weather runoff is any runoff that is not the result of a precipitation event. This is also referred to as "non-storm water discharges" (SWRCB, 2012a). Nonstructural measures have been implemented by the Parties that are designed to eliminate non-authorized, non-storm water runoff. These measures include public information and participation programs (PIPPs) and enforcement programs. Information on key programs is provided in Section 3.2, and a list of existing programs with brief descriptions is provided in Appendix B. Recent field visits have shown that these measures have been effective.

Receiving Water Assessment

In 2008, a study was conducted as part of Bight 2008 to assess water quality in southern California ASBS (Schiff et al., 2011). The study was designed to evaluate the range of natural water quality near reference drainage locations and to compare water quality near ASBS discharges to these natural water quality conditions. As part of the Southern California Bight 2013 Regional Monitoring Program (Bight 2013), additional reference monitoring was performed, and the 85th percentile reference thresholds were revised. During the development of

this draft Pollution Prevention Plan, compliance with natural water quality was determined by comparing receiving water data from wet weather monitoring recently conducted for ASBS 24 to the 85th percentile threshold of reference sample concentrations revised as part of the Bight 2013 effort.

Wet weather monitoring was performed by LACDPW at two receiving water locations: 1) S01, located off Zuma Beach directly out from ASBS-016, a 60-inch storm drain; and 2) S02, located off Escondido Beach directly out from ASBS-028, a 36-inch storm drain. Monitoring was conducted during storm events occurring on February 19 and March 8, 2013, and February 28, 2014. Wet weather flows from ASBS-016 only reached the ocean receiving water at S01 during the February 28, 2014, monitored event. The City performed monitoring at receiving water Site 24-BB-03R. For safety reasons, this site was only sampled during the February 28, 2014, event. Therefore, the assessment of compliance with natural water quality was primarily performed for receiving water station site S02, which had samples collected during three wet weather events. Receiving water station S02 is considered to be representative of the typical to worst case scenario of the potential impact that storm water runoff may have on the water quality within the ASBS based on being located adjacent to development that is typical to more dense in comparison to development along other parts of the ASBS. The receiving water natural water quality assessment is presented in Section 4.0, and a summary of the assessment is presented below.

In post-storm samples collected in the receiving water (Site S02), Selenium and total polynuclear aromatic hydrocarbons (PAHs) concentrations were above the 85th percentile reference threshold and had post-storm concentrations that exceeded those of the pre-storm samples collected during two consecutive monitored storm events (February and March 2013). Mercury results at Site S02 were above 85th percentile reference threshold and pre-storm concentrations for two consecutive events (March 2013 and February 2014). Based on the guidance found in Attachment 1 of the General Exception, these data indicate exceedances of natural water quality in the ASBS for these constituents.

Receiving water samples (Site S02) collected during the first monitored event (February 2013) had concentrations of total pyrethroids above both the 85th percentile reference threshold and pre-storm concentration. However, during subsequent monitoring event (March 2013) the concentration of total pyrethroids was not greater than the pre-storm concentration. Similarly, during the second monitored event (March 2013) concentrations of nitrate as N, copper, lead, and zinc were above the 85th percentile reference thresholds and the pre-storm concentrations. During the subsequent monitoring event (February 2014), receiving water (Site S02) concentrations for nitrate as N and zinc were below both the 85th percentile thresholds and pre-storm concentrations, and copper and zinc were below the pre-storm concentrations. Thus, these constituents are not considered an exceedance of the natural water quality in the ASBS.

Of the three storms monitored, the only event in which flow from ASBS-016 reached the receiving water at Site S01 was during the February 28, 2014, storm (third monitored event), and thus, was the only time receiving water chemistry data were obtained at S01 as part of the General Exception monitoring. Mercury, silver, zinc, and total PAHs concentrations in receiving water were greater than both the 85th percentile threshold and pre-storm concentrations for Site S01. While above the 85th percentile thresholds and pre-storm concentrations, the measured concentrations of mercury, silver, zinc, and total PAHs at the receiving water Site S01 during

one event is not considered to be an exceedance of natural water quality. Based on the Site S02 results from the first and second events, total PAHs is considered to be an exceedance of natural water quality. Based on the Site S02 results from the second and third events, mercury is considered to be an exceedance of natural water quality. The receiving water Site S01 measured concentration of mercury and total PAHs being above both the 85th percentile threshold and pre-storm concentrations is consist with the results for Site S02 where these constituents are considered to be exceedances of natural water quality.

Pre-storm and post-storm samples were collected and analyzed at Site 24-BB-03R. The selenium concentration in the receiving water was greater than both the 85th percentile threshold and pre-storm concentrations for Site 24-BB-03R (see Table 4-3). The concentration of selenium being above the 85th percentile threshold and pre-storm concentrations for a single monitored event is not considered an exceedance of natural water quality at Site 24-BB-03R. The selenium result at Site 24-BB-03R above the 85th percentile threshold and pre-storm concentrations is consist with the results at Site S02 where selenium is considered to be an exceedance of natural water quality based on first and second event results.

Wet Weather Pollution Loading Reduction Assessment

The majority of the County Beach discharge is sheet flow from parking lots directed into beach sand and does not reach the ASBS. The vehicle speed of travel within the County beach parking lots is low and vehicle traffic is much less than typical roadways. Those factors, combined with frequent mechanical sweeping of the parking lots and the potential discharge sources associated with County beach parking lots are not considered contributors to the current exceedance of natural water quality in the ASBS.

Anthropogenic Sedimentation Assessment

In accordance with the requirements of the General Exception, the natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation (SWRCB, 2012a). An assessment of the potential areas prone to anthropogenic sedimentation was performed as part of this Pollution Prevention Plan for the purpose of identifying areas where sediment control best management practices (BMPs) may be required. The general assessment process included first performing a desktop analysis of geological conditions, topography, land use, and aerial imagery for the applicable area. Next, a reconnaissance of the area was performed to verify desktop findings and further analyze the drainage areas. Finally, the desktop and reconnaissance data collected were then complied into this Plan.

Geologic processes, beginning as far back as 80 million years, created the sedimentary formations predominantly found along the coast shoreline and the mesa upland from Point Dume, which include siltstone and sandstone. Approximately 16 million years ago, seismic actively began and continued for three million years to form the Santa Monica Mountains, which are composed of a combination of sedimentary and igneous rock formations (City, 1995). Land use zoning and development along the coast line within the ASBS 24 assessment area includes primarily large, single-family residences, and state, county, city, and private beach facilities.

The desktop analysis included determining the general sediment risk for the area based on the procedures outlined in the Construction General Permit. These procedures included determining

the rainfall erosivity (R factor), for the area, properties of common soils. These factors were applied to various slope conditions ft.to determine the sediment runoff potential for disturbed areas within the watershed. Calculation results indicated that the potential for soil loss within disturbed areas increases at a rapid rate for areas with slopes greater than 10% and heights of greater than a few feet. These results were used during field reconnaissance to aid in determining if areas have the potential to contribute anthropogenic sedimentation to ASBS 24.

Field reconnaissance was performed in the areas with a focus on the areas that drain to the identified potential discharge source locations along ASBS 24. In general, the drainage areas primarily consisted of larger lots (0.25 to approximately 1 acre) with existing residential structures, hardscape improvements, and landscaping. Landscape vegetation covers within the developed areas were observed to be well maintained. Small private drains were not observed to terminate where potential discharges could result in erosion (e.g., generally drains were observed to be routed completely down the sloped areas).

The conclusion of the anthropogenic sediment assessment is that currently, there are no areas prone to anthropogenic sedimentation within the potential discharge source locations identified within the Parties' jurisdiction. Land use in the drainage areas consists predominantly of residential with some beach facility properties. The areas associated with residential properties were observed to have good vegetative cover and appeared to be regularly maintained by landscaping professionals (see Figure 7-9). The natural slope and bluff areas located down-gradient of improvements were observed with good vegetative cover on the mild sloped area and less to no vegetation on the very steep/vertical bluff face (see Figure 7-18). This is most likely due to the dense nature of the bluff sedimentary composition. Signs of rapid (unnatural) erosion were not observed on the very steep/vertical bluff faces (i.e., bluff in the developed areas looked similar to those in vacant/undeveloped areas of the assessment area). Therefore, at this time, no additional sediment BMPs are proposed by this plan.

Cost Estimate

The Parties have implemented numerous nonstructural controls and related programs in order to eliminate non-storm water, non-authorized discharges to ASBS 24. The Parties continue to maintain these measures, and the annual estimated costs associated with the key programs, which are detailed in Section 3.0, are provided on Table ES-2. Appendix B contains a list along with brief descriptions of various existing nonstructural measures implemented by the Parties.

Table ES-2. Annual Nonstructural Programs Maintain Zero Dry Weather Flows Costs

Program Type	Approximate Cost ($/year)
PIPP Subtotal	**$117,957**
Enforcement Subtotal	**$59,557**
Total	**$177,514**

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LIST OF ABBREVIATIONS AND ACRONYMS

Ag	Silver
AMSL	above mean sea level
As	Arsenic
ASBS	Areas of Special Biological Significance
Bight 2008	Southern California Bight 2008 Regional Monitoring Program
Bight 2013	Southern California Bight 2013 Regional Monitoring Program
BMP	best management practice
CA	California
Caltrans	California Department of Transportation
Cd	Cadmium
City	City of Malibu
Committee	Bight 2013 ASBS Planning Committee
County	County of Los Angeles
CPS	Coastal Preservation Specialist
Cr	Chromium
Cu	Copper
District	Los Angeles County Flood Control District
EI	Erosivity Index
EMAP	Monitoring & Assessment Program
EPPP	Environmentally Preferable Purchases and Practices Policy
ESRI	Environmental Systems Research Institute
ft.	Feet
GIS	Geographic Information System
Hg	Mercury
IC/ID	Illicit Connection/Illicit Discharge
ID	Identification
in.	Inches
LACDPW	Los Angeles County Department of Public Works
LACFCD	Los Angeles County Flood Control District
LACoMAX	Los Angeles County Materials Exchange
LIEP	Landscape Irrigation Efficiency Program
MACC	Malibu Area Conservation Coalition
mg/L	milligram per liter
MS	Microsoft
MS4	municipal separate storm sewer system
N	Nitrogen
Ni	Nickel
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and Maintenance
Ocean Plan	California Ocean Plan
OFG	Ocean Friendly Garden
P	Phosphorus
PAH	polynuclear aromatic hydrocarbons
Parties	LACDPW, District, and City
Pb	Lead
PCH	Pacific Coast Highway

PIPP	public information and participation program
Plan	Pollution Prevention Plan
RCPP	Recycled Products Purchasing Policy
RMD	Road Maintenance Division
SCAG	Southern California Association of Governments
SCCWRP	Southern California Coastal Water Research Project
Se	Selenium
State Board	State Water Resources Control Board
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	California State Water Resources Control Board
TMDL	total maximum daily load
TN	total nitrogen
TP	total phosphorus
TSS	total suspended solids
USEPA	United States Environmental Protection Agency
USGS	U.S. Geological Survey
USLE	Universal Soil Loss Equation
Weston	Weston Solutions, Inc.
WQOs	water quality objectives
Zn	Zinc
µg/L	microgram per liter

1.0 INTRODUCTION

In 1974 and 1975, the California State Water Resources Control Board (SWRCB) designated 34 coastal areas in California as Areas of Biological Significance (ASBS). The ASBSs are ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. One of these, ASBS 24, is located along 24 miles of the Ventura and Los Angeles County coastline, from Laguna Point to Latigo Point (SWRCB, 1979).

The California Ocean Plan (Ocean Plan) prohibition on discharges of waste to ASBS has been in place since 1983. The SWRCB may grant exceptions to this prohibition if the exception will not compromise the protection of ocean waters for beneficial uses and the public interest will be served (SWRCB, 2009). On March 20, 2012, the SWRCB adopted a General Exception to the Ocean Plan ASBS waste discharge prohibition. The General Exception was amended and adopted as Resolution 2012-0031 on June 19, 2012 (SWRCB, 2012a).

The General Exception includes Special Protections that dischargers covered under the General Exception must comply with. For ASBS 24, the County of Los Angeles (County), the Los Angeles County Flood Control District (District), and the City of Malibu (City) were included in the list of responsible entities required to prepare an ASBS Compliance Plan for point source discharges of storm water runoff and a Pollution Prevention Plan for nonpoint source waste discharges by September 20, 2013. The County, District, and City submitted a formal request to the State for a one year extension of the submittal date of this Plan. The State subsequently granted this request and the date for submission became September 20, 2014. This Pollution Prevention Plan (Plan) has been prepared by the County, District, and City (the Parties), as specified in the General Exception. The Compliance Plan has been prepared under a separate cover.

1.1 Pollution Prevention Plan Objective and Scope

This Plan documents the existing ASBS and ASBS watershed conditions and policies within the Parties' jurisdiction. The purpose of this assessment is to demonstrate either compliance with the nonpoint source discharges of storm water requirements specified in the General Exception Attachment B – *Special Protection for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharge* (Special Protections), or describe the steps necessary to achieve compliance within the time frame allotted by the Special Protections. This Plan focuses on source discharges not regulated under the National Pollutant Discharge Elimination System (NPDES) permit (SWRCB, 2012a). The Parties have prepared a Compliance Plan, under a separate cover, to evaluate sources regulated under the NPDES permit that include outfalls that have associated storm networks that drain significant areas and entirely or partially maintained by an agency. These NPDES permit regulated sources coincide with conveyances that are equal to or greater than 18 inches in size that discharge directly to the ASBS shoreline.

The following tasks associated with source discharge locations not regulated under the NPDES permit and the associated drainage areas were performed as part of the process to prepare this Plan:

- Preparing a map of the ASBS watershed showing surface drainage of storm water runoff, including potential discharge source locations (areas of sheet flow and conveyances less than 18 inches in size) along with point source locations.
- Preparing procedures to allow for future updates to the Pollution Prevention Plan map.
- Evaluations of the compliance with the prohibition of non-storm water, non-authorized discharges (i.e., discharges not composed entirely of storm water and not specifically allowed in accordance with Special Protections Section I.A.1.e).
- Collection and analysis of receiving water quality samples in accordance with Section IV of the Special Protections.
- Assessment of whether potential discharge source storm water discharges may be contributing to the alteration of the natural water quality of the ASBS.
- Assessment of pollutant load reduction targets.
- Assessment of potential sources of anthropogenic sedimentation.
- Compilation of assessment and data into this Pollution Prevention Plan.
- Description of the nonstructural controls currently employed and planned in the future and implementation schedule

1.2 ASBS 24 Watershed Responsible Agencies

The Laguna Point to Latigo Point ASBS, also referred to as ASBS 24, stretches 24 miles, contains 11,842 marine acres, and is the largest ASBS along the mainland of Southern California. The boundary of ASBS 24 extends out from the mean high tide line at Laguna Point in Ventura County to either 1,000 ft. from shore or to the 100-ft. isobath (whichever is greater) in a southwesterly direction to Latigo Point in Malibu, Los Angeles County.

This Plan includes the applicable drainage areas and potential discharge sources that are within the Parties' purview. These include the areas of the unincorporated County and City along the coast south of the Los Angeles County boundary and west of Latigo Point. Figure 1-1 shows the overall ASBS watershed within the County, along with jurisdictional boundaries. Properties within the ASBS watershed in which the Parties do not have jurisdictional authority and thus are excluded from this Plan include, but are not limited to, federal lands, state parks, and state rights-of-way.

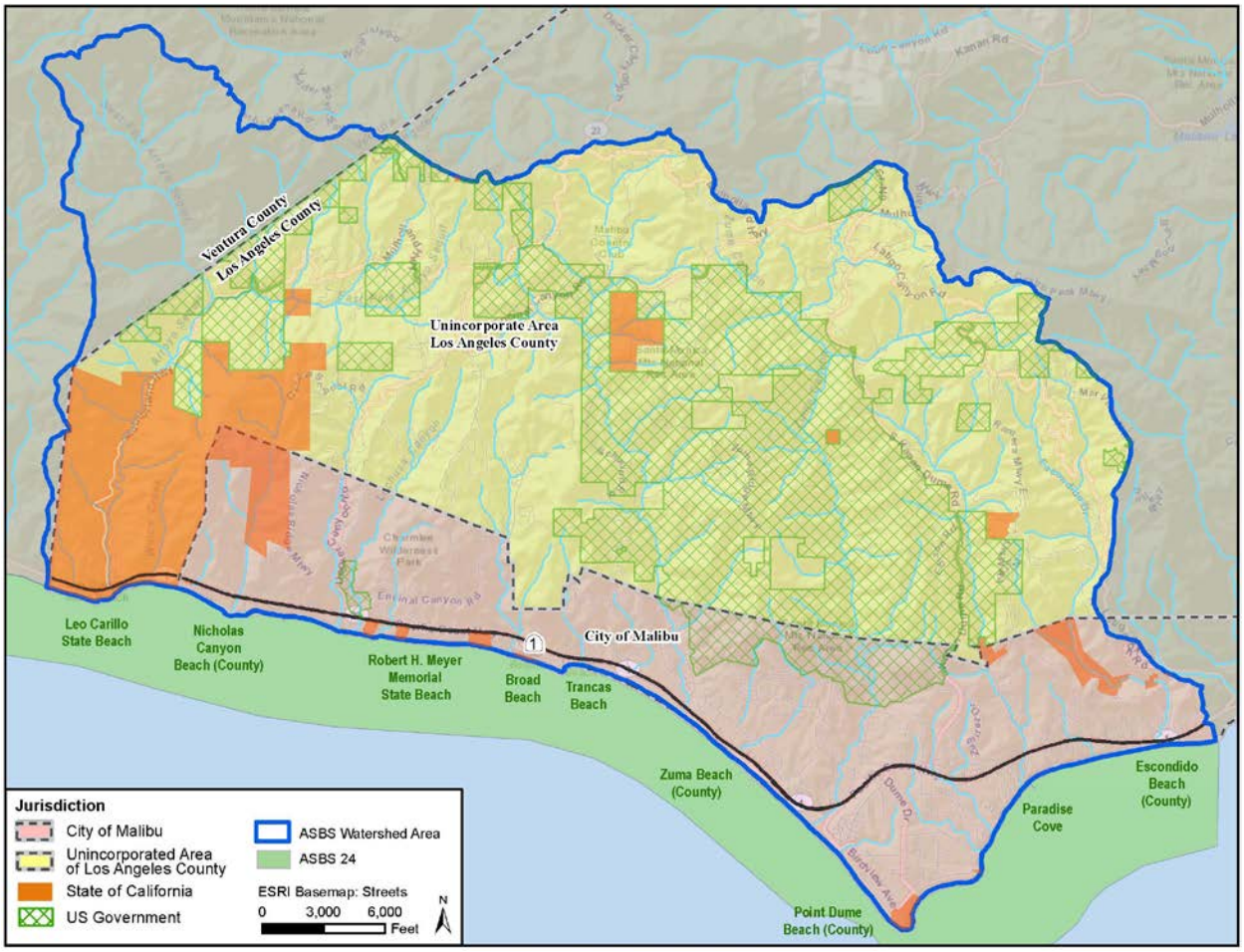

Figure 1-1. ASBS 24 Watershed and Jurisdictional Boundaries

2.0 ASBS 24 WATERSHED

2.1 General Site Conditions and Land Use

2.1.1 Topography

The topography along the shoreline within Pollutant Prevention Plan assessment areas at Broad Beach, Zuma Beach, Point Dume Beach, and Escondido Beach consists of gentle slopes that extend up-gradient from the Pacific Ocean. Elsewhere in the watershed, the topography consists of steep natural bluffs followed by coastal mesas. Most of the developed areas along the coast lie below an elevation of 100 ft. above mean sea level (AMSL), with the exception of the Point Dume and Malibu Park areas, which reach an elevation of approximately 500 ft. AMSL. The hillsides and coastal mesas, such as Big Rock and Las Flores, have elevations ranging from 300 to 400 ft. above mean sea level AMSL (City, 1995).

North of Broad Beach extending to the County jurisdictional boundary, the coastal topography consists of narrow beaches adjacent to near-vertical natural bluffs that extend between 50 ft. to 200 ft. AMSL. The mesas above the bluffs slope towards the coast at approximately 2 to 10%.

The area of Broad Beach south to Zuma County Beach is characterized, in general, by gentle seaward sloping natural topography (approximately 2 to 4%), with some near-vertical bluffs located further inland at varying distances from the ocean between approximately 1,000 ft. to 3,500 ft., and are similar to those bluffs previously described.

The Point Dume area, both northwest and northeast of the point, consists of narrow beaches followed by near-vertical bluffs that extend from approximately 200 ft. north of the point to approximately 500 ft. at and northeast of the point. The mesa area above the beach is large and consists of sloping terrain that has formed high and low areas as well as valley and canyons that drain the area to the ocean; however, several of the residents located adjacent to the bluffs have small private drains (potential discharge source locations) that are therefore are included in this assessment. The coastal mesa topography continues northeast to approximately Escondido Beach, where the area has an approximately 10% gradient towards Escondido Creek.

South of Escondido Creek, the topography is similar to that of Broad Beach with an area of gentle seaward sloping terrain along the ocean, followed by relatively small inland bluffs and upland sloped areas.

2.1.2 Land Use

Land use data within the drainage area to the portion of ASBS 24 located south of the County jurisdictional boundary were compiled and analyzed using GIS software and available land use data sources, including data provided by the City (2010 data for the City portion) and LACDPW (2008 data for the County portion). Both of these sources use Southern California Association of Governments (SCAG) land use codes. The SCAG classifications were generalized for inclusion into this document and for mapping purposes. Roads were not included in the land use;

however, data were filled in with the mapping and analysis software. Figure 2-1 shows the land use designations within the Parties' jurisdiction.

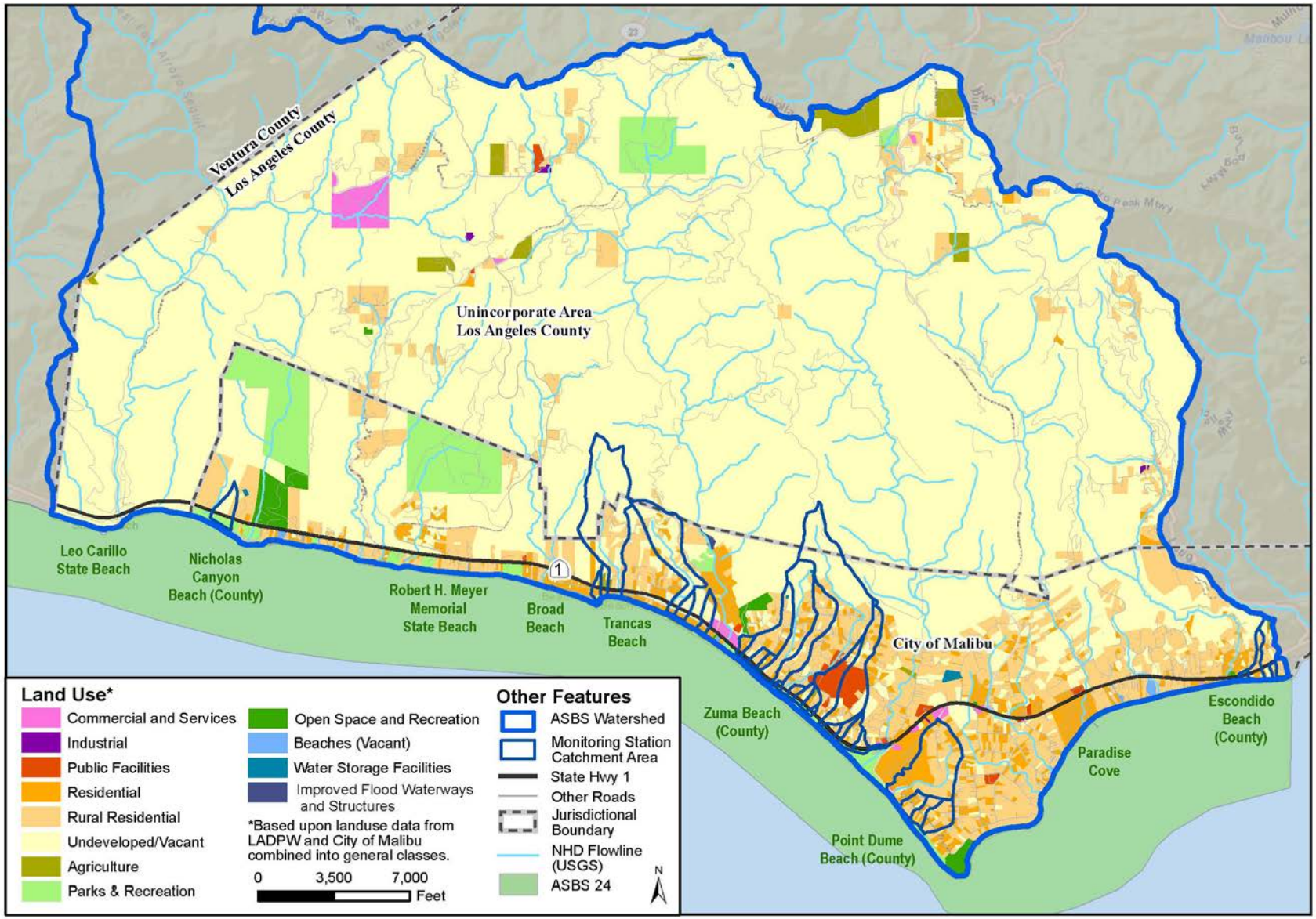

Figure 2-1. ASBS 24 Drainage Area Land Use Map

2.2 Geological Setting

2.2.1 Regional Geology

The ASBS 24 coastal drainage area is composed of an extremely complex geology that has resulted from the geologic uplift that formed the Santa Monica Mountains. The area is located within the northwestern corner of the Los Angeles basin, which lies at the boundary or juncture between two major geomorphic or structural provinces of southern California: (1) the Peninsular Ranges province, consisting primarily of a northwest-oriented structural grain; and (2) the Transverse Ranges structural province, which features a predominantly east-west-oriented structural grain. The Los Angeles structural basin originated roughly 16 million years ago in what is designated as the Miocene geologic epoch. However, the Los Angeles basin area, in general, has been a site of continuous sedimentary deposition for at least the past 80 million years. The sedimentary rocks underlying the Santa Monica Mountains in the ASBS 24 drainage area are generally highly folded and complexly faulted (City, 1995).

2.2.2 ASBS 24 Geology

The Malibu Coast fault runs in an east-west alignment within the ASBS 24 drainage area. The fault is a boundary between two very different geologic terranes: (1) to the south, Catalina Schist is overlain by Miocene and younger deposits; and (2) to the north, Santa Monica Slate and plutonic granodiorite is overlain by Upper Cretaceous through upper Miocene deposits (i.e., Santa Monica Mountains) (Yerkes and Campbell, 1979). The fault is aligned in a near-east-west direction following the coast line from the County's north jurisdictional boundary east to Lechuza Point. East of Lechuza Point the fault continues in a near-east-west alignment to Corral Beach (east of ASBS 24). The fault continues east along the coastline (NPS, 2007). North of the Malibu Coast fault, the local bedrock structure of the Santa Monica Mountains can be modeled as an asymmetric, south-vergent, westward-plunging anticline, including sandstone and siltstone bedrock (e.g., Tuna Canyon Formation, Sespe Formation, Vaqueros Formation, Topanga Group). South of the Malibu Coast fault, the ductile bedrock units and the Trancas and Monterey Formations contain a high percentage of shales, mudstones, and diatomaceous rocks that exhibit complex folding and pervasive shearing (City, 1995).

The majority of the area along the Malibu coast is composed of the Santa Monica Mountains. The portion of ASBS 24 and upland areas between Point Mugu, which is north of the County's jurisdictional boundary, and La Piedra State Beach, comprise the Santa Monica Mountains formations. North of Point Mugu, the coastal area consists of low-lying land that comprises the Ventura-Oxnard Alluvial Plain. The Malibu Coast fault separates the Santa Monica Mountains from the coastal formations between La Piedra State Beach and Corral Beach. The portion of ASBS 24 between La Piedra State Beach area and the south extents of Broad Beach, south of the Malibu Coast Fault, consists of Malibu Bluff Coast Trancas Formation. The Trancas Formation consists chiefly of sandstone, mudstone, silty shale, and claystone. This formation extends north (upland from the ocean), varying distances between a few hundred feet to a few thousand feet. Southeast of Broad Beach, the ASBS and entire upland coastal area, bound to the north by the Malibu Coast Fault, comprise the Malibu Bluff Coast Monterey/Modelo Formation (SWRCB, 1979). The Monterey Formation consists of marine clay shale and laminated to platy siltstone

that are variably diatomaceous, bituminous, phosphatic, siliceous, or cherty, and interbedded altered vitric tuffs and fine- to medium-grained sandstone that locally is schist bearing.

The Malibu bluff coast is triangular with its widest point at Point Dume. This region is structurally the most complex within the ASBS. The rocks are highly folded and steeply dipping so that very different rock types lie next to one another. The western part of this bluff coast from little Sycamore Canyon to Trancas Beach is composed of older Tertiary (Miocene) erosion-resistant rocks of the Trancas Formation. The white cliffs of Paradise Cove are outcrops of the Miocene age Modelo Formation which form steep, inclined bids from Zuma Beach eastward to Corral Beach. This formation is predominantly siliceous shale and may have been formed in the deep sea. The headland at Point Dume is a highly resistant igneous breccia that has protected the softer sedimentary shale behind it from erosion. In addition to the Miocene deposits, there is an irregular veneer of Pleistocene marine terrace deposits on the bluff between the ocean and the mountains adjacent to the eastern section of the ASBS. This is reddish, poorly stratified and sorted material that is soft and easily dissected. It tends to form steep-sided stream gullies and sea cliffs (SWRCB, 2008).

The geologic features within the ASBS 24 drainage area are shown in Figure 2-2. Map symbols used along the coastal area were defined using the National Geologic Map Database. Pleistocene marine terrace deposits along the shoreline include the Trancas and Monterey Formations.

- Qa – Alluvial gravel, sand, and clay of flood plains.
- Qaf – Artificial cut and fill.
- Qao – Older dissected alluvial gravel, sand and clay; on coastal area deposited in part on a wave-cut platform, forms several terraces.
- Qg – Gravel and sand of major stream channels.
- Qls – Landslide debris.
- Qos – Old dune sand at Point Dume.
- Qs – Beach sand.
- Tr – Trancas Formation composed of marine sandstone, mudstone, silty shale, and claystone.
- Tmt – Modelo/Monterey Formation composed of marine clay shale and laminated to platy siltstone with sandstone.

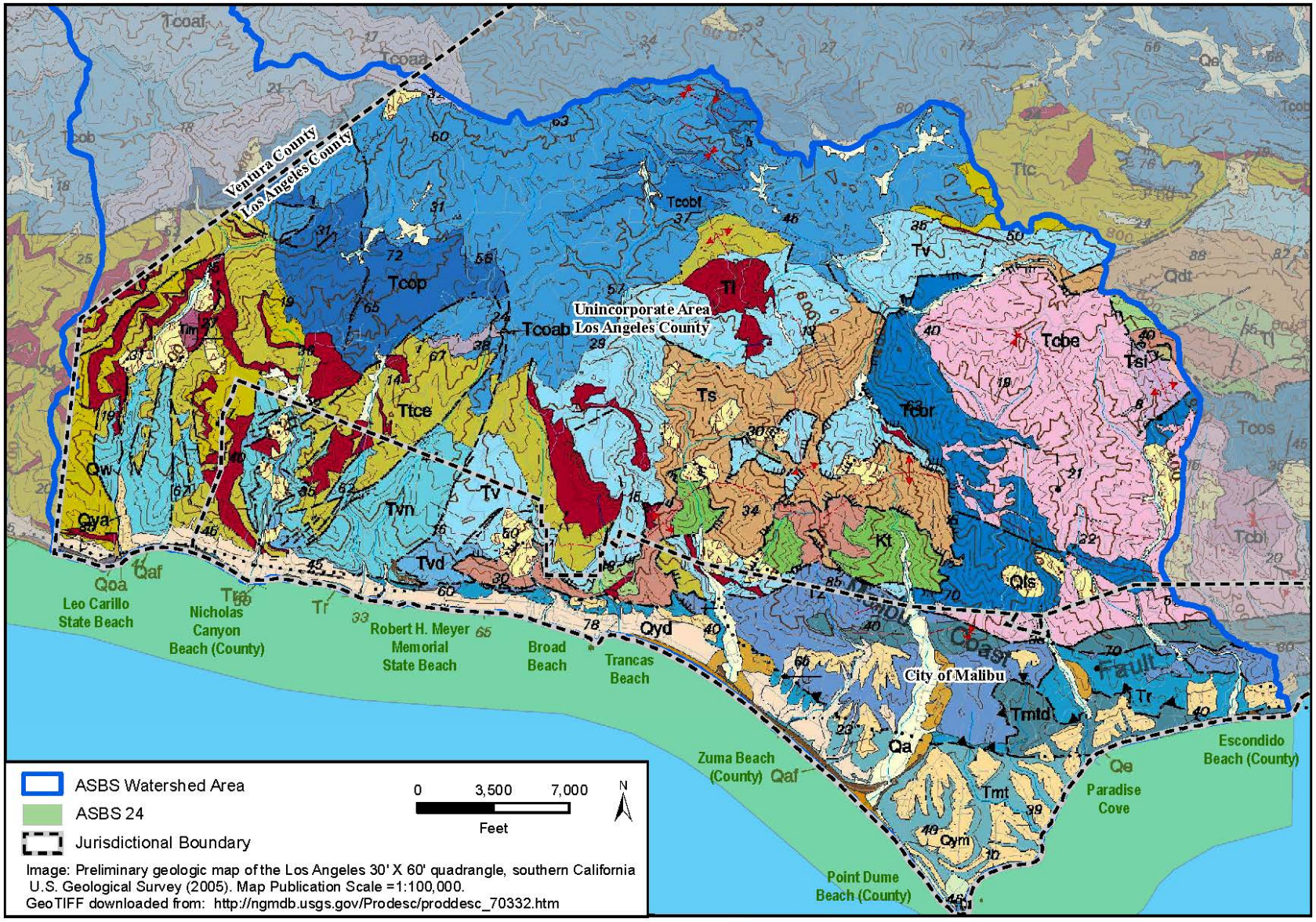

Figure 2-2. Geology Map of Overall ASBS 24 Drainage Area

2.3 Site Hydrology

The Santa Monica Mountains within the ASBS watershed generally slope towards the south to southwest. Except for the lower laying and relatively flat portion of the coast north of Point Dume extending to Broad Beach, the coast is lined with steep bluff areas that vary in height. Slopes along the coast above the bluff are gentle to moderate, with gradients typically between 2% and 20%. Inland, the watershed consists of much steeper terrain (typically 3:1 or steeper) covered with native coastal vegetation.

The Santa Monica Mountains have formed various peaks and valleys that collect runoff into 21 natural streams and gullies that drain to ASBS 24. Outside of this network of natural drainage 39 storm drain outfalls 18 inches or larger in diameter or width convey flows to the shoreline. Not included in the drainage areas to these 39 outfalls are several residential properties located adjacent to the shoreline, generally on top of coastal bluffs. Typically, storm water runoff flows from these residential properties are conveyed to the beach through small drains (less than 18 inches in diameter), usually plastic pipe that terminates at to the bottoms of the bluffs. Also outside the drainage areas to the 39 outfalls are areas of sheet flow from County beach parking lots that are directed to the sandy beaches, such as Zuma Beach.

2.4 Monitoring Activities

2.4.1 2013 Regional Monitoring Program

As part of the exception process, LACDPW and the City participated in the Bight 2008 and Bight 2013 ASBS Planning Committee (Committee) with the State Board, the Southern California Coastal Water Research Project (SCCWRP), and other ASBS dischargers in Southern California. Together, the Committee developed a Regional ASBS Work Plan that is based on the Special Protections document. The Regional ASBS Work Plan was intended to provide compliance guidance to applicants of the General Exception in Southern California that wish to participate in the Southern California Bight 2013 Regional Monitoring Program (Bight 2013).

All outfalls that are equal to or greater than 18 inches in diameter are required to be monitored for oil and grease, total suspended solids (TSS), and toxicity, while outfalls that are equal to or greater than 36 inches in diameter are required to be monitored for metals, polynuclear aromatic hydrocarbons (PAHs), pyrethroids, organophosphorus pesticides, and nutrients (ammonia, nitrate, and phosphates) in addition to oil and grease, TSS, and toxicity. Furthermore, each discharger participating in the Regional Monitoring Program is required to monitor one ocean receiving water station that is representative of worst-case discharge conditions (i.e., co-located at a large drain greater than 36 inches, if possible). Potential discharge sources (e.g., small drains and areas where sheet flow is directed) are not required to be monitored as part of the Regional Monitoring Program.

The ASBS Special Protections monitoring data used in this document were collected and analyzed during the 2012-2013 and 2013-2014 wet seasons. Only the receiving water monitoring portions of the data are applicable to and used in this Plan. The monitoring performed complies with the monitoring requirements of the Regional Monitoring Program through the identification

of water quality impacts to ASBS 24 during storm events. The Special Protections document describes the following two types of monitoring programs:

1. **Core Discharge Monitoring** – collecting and analyzing wet weather runoff from the discharge of outfalls during a storm event (used for assessment detailed in the Compliance Plan).
2. **Ocean Receiving Water Monitoring** – collecting and analyzing samples from the ocean before and after a storm event at two locations (i.e., directly in front of the discharge and at a reference site removed from the discharge). For the monitoring performed during the 2012-2013 and 2013-2014 wet weather seasons, ocean receiving water monitoring at the discharge site was the responsibility of the discharger, while reference station monitoring was performed by SCCWRP.

2.5 ASBS 24 Potential Discharge Source Descriptions

The SWRCB prepared a *Program Final Environmental Impact Report* that included, as an appendix, a list of ASBS Drainages (SWRCB, 2012b). This list includes a total of 463 potential discharge sources associated with ASBS 24 that are composed of small drains and areas where sheet flow is directed (e.g., parking lot). Of these 463 potential discharge sources, the SWRCB list identified the responsible party as "Los Angeles County" for 153 sources and the City of Malibu for 134 sources. The remaining potential discharge sources are identified as the responsibility of "private or other public agencies" (176).

The listed sources are referred to throughout this Plan as potential discharge sources based on the potential that some of the drains may no longer be in service or that some of the listed sources are configured to not discharge to the receiving water, even during large storm events (e.g., potential discharge sources that terminate in sandy beach upland and far from the receiving water).

Thirty-two of the potential discharge sources listed by the SWRCB as falling under the County's responsibility are located in Ventura County. Similarly, 11 potential discharge sources with County-identified responsibility and five potential discharge sources with City-identified responsibility are located within the Leo Carrillo State Park beach area, and as such should be correctly identified as the responsibility of the California Department of Parks and Recreation. Additional discrepancies were identified through reviewing the list and performing field reconnaissance, such as redundant reporting of potential discharge sources (e.g., potential discharge source and point source identified where only a point source is located). A summary of the modifications to the SWRCB-listed potential discharge sources is provided on Table 2-1.

Table 2-1. Summary of Modifications to SWRCB Potential Discharge Sources List

SWRCB Identification	Responsibility (Per SWRCB)	Actual Responsibility	Notes
MUG004, 011, 012, 018, 020, 021, 024, 026, 027, 030, 032-040, 043-045, 047, 050, 054-057, 062-065	County	Others	Located in Ventura County
MUG068, 069, 071, 074, 080-086	County	California Dept. of Parks and Rec.	Located at Leo Carrillo State Beach
MUG238	County	County	Correlates to Outfall ASBS-004
MUG239	County	County	Correlates to Outfall ASBS-005
MUG327	County	County	Correlates to Outfall ASBS-011
MUG360	County	County	Correlates to Outfall ASBS-016
MUG370	County	N/A	Redundant (Correlates to MUG369)
MUG391	County	County	Correlates to Outfall ASBS-022
SAD0020, 0041, 0070-0072	City of Malibu	California Dept. of Parks and Rec.	Located at Leo Carrillo State Beach
SAD0090, 0102, 0103	City of Malibu	County	Located at Nicholas Canyon County Beach
MUG179-186, 188-232, 250-282, 285-299, 316-317, 319-325, 328-329, 331-333, 335-337, 339-342, 344-345, 348, 350-354, 368, 372-374, 376, 378-385, 387-390, 393-394, 408-434	Private or Public Agency	Private or Undetermined Ownership	Various locations along ASBS 24

The remaining potential discharge sources identified by SWRCB with County responsibility includes either small drains associated with private, single-family dwellings, which are not County's responsibility, or County beach sheet flow discharge locations. The small drains originating from private residential lots or other properties (e.g., park land) and not associated with County beaches should be identified as private or undetermined ownership, which includes 81 potential discharge sources. Similarly, the remaining 126 potential discharge sources, which are identified as the responsibility of the City, should be classified as private or undetermined ownership because these drains originate from residential lots or other properties and have not been extended by County or City. Mapping the locations of the remaining sources identified as the responsibility of "private or other public agencies" indicates that these 170 potential discharge sources are associated with residential lots that should be identified as private. Table 2-2 provides a summary of the County and private or undetermined ownership potential discharge sources within the ASBS 24 watershed. Figure 2-3 shows the locations of the potential discharge sources correctly identified as discussed in this Plan.

Table 2-2. Summary of Potential Discharge Sources

Responsible Party	Location	Number of Potential Discharge Sources
Los Angeles County	Nicholas Canyon Beach	9
	Zuma Beach	17
	Total County	**26**
Private or Undetermined Ownership	Nicholas Canyon Beach Area	53
	El Pescador Beach Area	19
	La Piedra Beach Area	41
	El Matador Beach Area	31
	Trancas/Broad Beach	61
	Westward Beach	23
	Point Dume Natural Reserve	36
	Paradise Cove	15
	Escondido Beach	104
	Total Private or Undetermined Ownership	**383**
Total		**409**

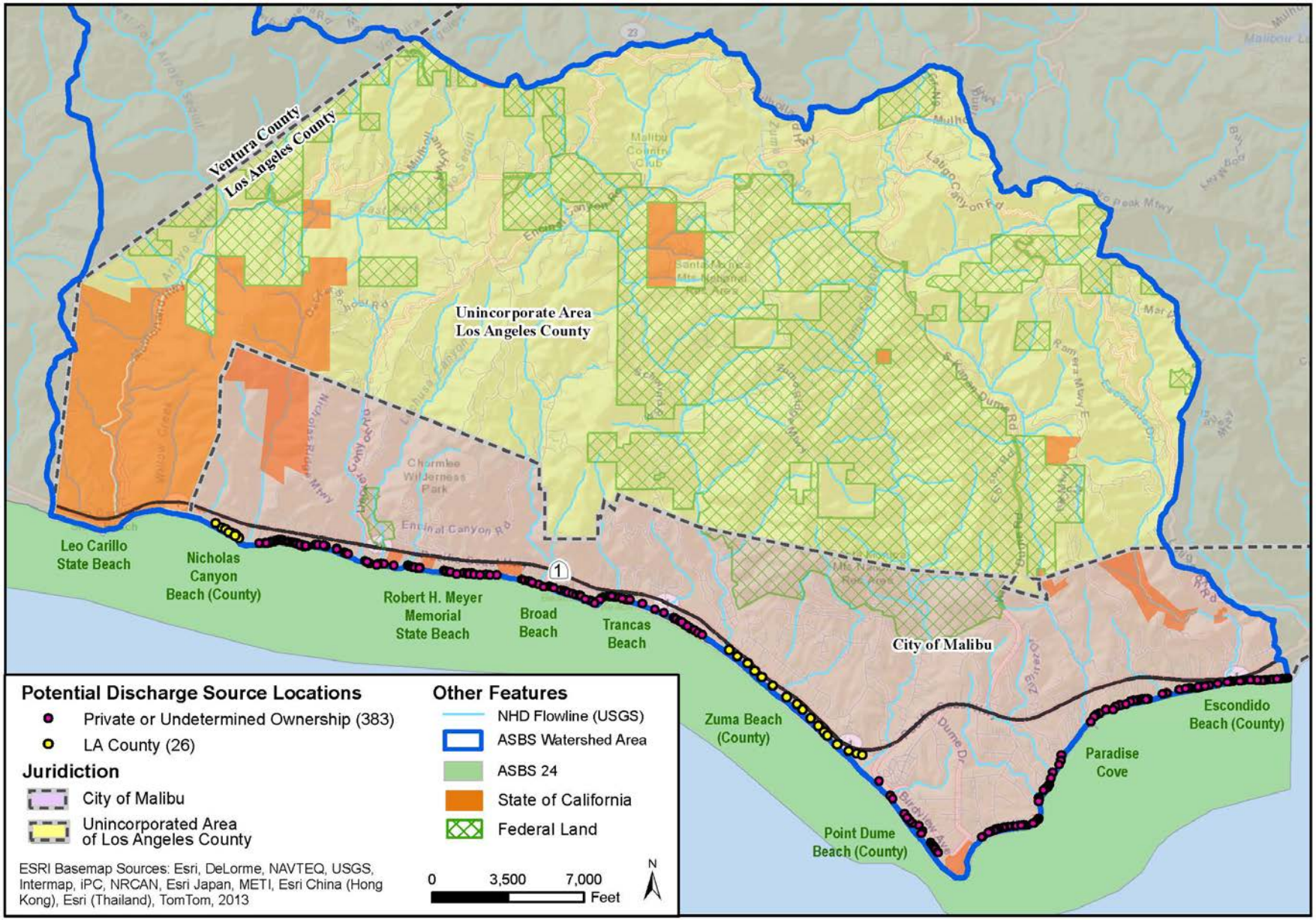

Figure 2-3. Identified Potential Discharge Source Locations

2.6 County Beach Potential Discharge Sources

There are 26 potential discharge sources not covered under the NPDES permit that are currently identified as the responsibility of the County. The potential discharge source locations are shown in Figure 2-4.

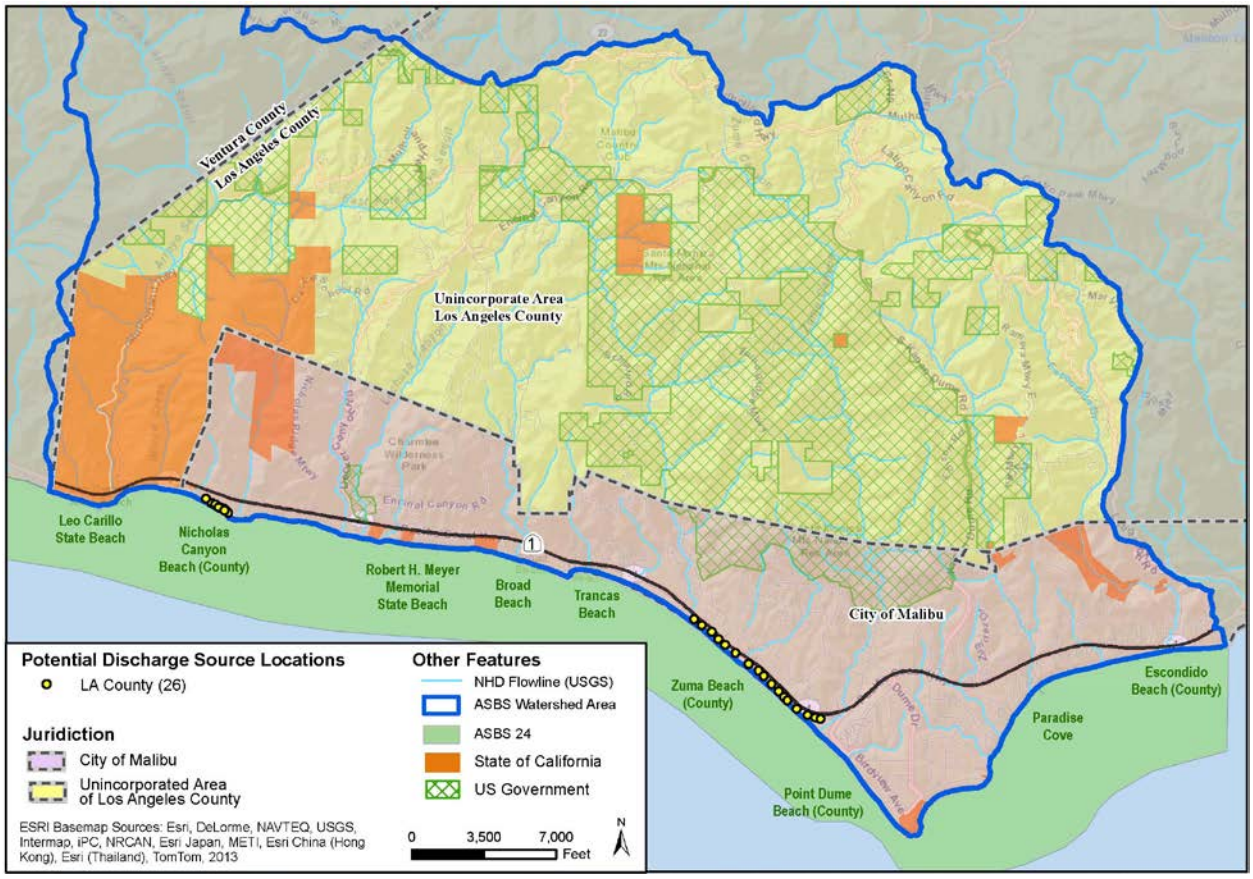

Figure 2-4. County Potential Discharge Source Locations

2.6.1 Nicholas Canyon County Beach

Nicholas Canyon County Beach is located south of Leo Carrillo State Beach and has nine identified potential discharge sources that include a storm drain pipe connected to three inlets in the asphalt concrete parking; drains originating from private residences; and sheet flow discharge from Nicholas Beach Road. Figure 2-5 shows the parking lot and one of the three inlets that collects wet weather flows and conveys the runoff to the beach area down below the parking lot. Figure 2-6 and Figure 2-7 show the slope section and outlet, respectively, of a small drain pipe originating from a residential property. Figure 2-8 shows the end of Nicholas Beach Road, which is a potential location for sheet flow to discharge to the beach sand.

Figure 2-5. Nicholas Canyon County Beach Parking Lot and Inlet

Figure 2-6. Small Drain Originating from Private Residence (ID #MUG091, 12-Inch Diameter)

Figure 2-7. Small Drain End at Nicholas Canyon County Beach (ID #MUG091, 12-Inch Diameter)

Figure 2-8. Potential Sheet Flow Discharge Source at End of Nicholas Beach Road (MUG087)

2.6.2 Zuma County Beach

Zuma County Beach is located south of Broad Beach and north of Westward County Beach. The beach includes 12 parking lots located between the Pacific Coast Highway and the wide (approximately 200 ft.) sandy beach area. The parking lots are sloped towards 17 low points. At these low points, the curb and sidewalk are depressed and level with the asphalt, which allows storm water runoff to exit the parking lots and flow into the beach sand. These low areas also serve to provide access to the beach for pedestrians and authorized vehicles. The potential discharge sources identified by the SWRCB as the County responsibility at Zuma County Beach correspond to these sheet flow conveyance locations (low points). A typical low point is shown in Figure 2-9.

Figure 2-9. Typical Parking Lot Low Point/Sheet Flow Conveyance at Zuma County Beach (ID #MUG237)

2.7 Private or Undetermined Ownership Drains

As previously discussed, there are 383 potential discharge sources on the SWRCB list of drainages that originate from private residences or other properties (e.g., park lands) and terminate along the beach of ASBS coastline. Figure 2-10 shows the locations of these private or undetermined ownership potential discharge sources. Field reconnaissance was performed on some of the accessible areas to determine the accuracy of the SWRCB list. The accessible areas included are north of the La Piedra State Beach, Westward County Beach, Little Dume Cove, and Paradise Cove areas. Although the drain locations and sizes for all the drains in the areas where reconnaissance was performed did not match exactly those listed in the SWRCB reference, the overall total number of pipes and corresponding sizes, in general, did correspond

to the SWRCB list. Figure 2-11 through Figure 2-16 show some of the drains observed that are typical of the private small drains along the ASBS.

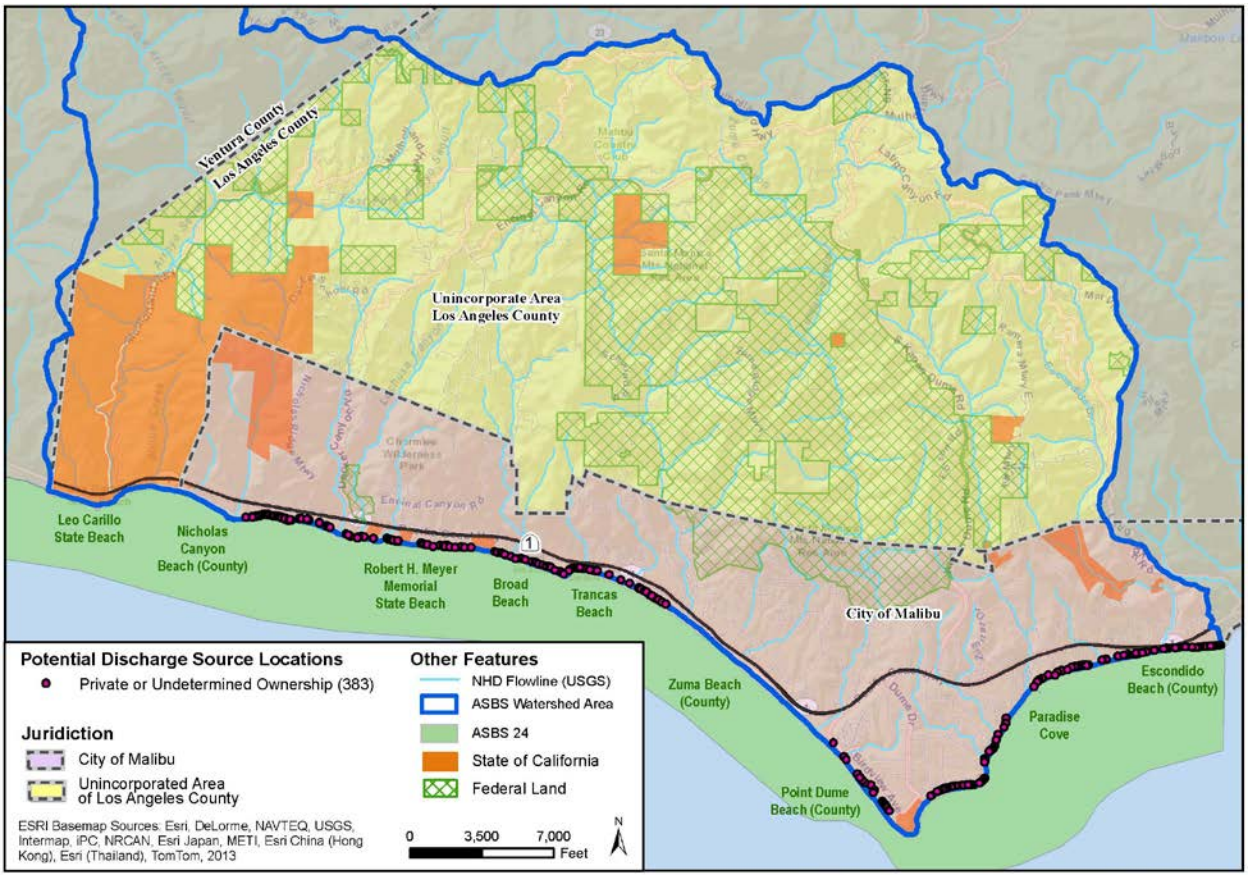

Figure 2-10. Private or Undetermined Ownership Potential Discharge Source Locations

Figure 2-11. Typical Residential Small Drain Near La Piedra State Beach (ID #MUG151, 6-Inch Diameter)

Figure 2-12. Typical Residential Small Drain Near La Piedra State Beach (ID #SAD379, 6-Inch Diameter)

Figure 2-13. Typical Residential Small Drain Near La Piedra State Beach (ID #SAD375, 3-Inch Diameter)

Figure 2-14. Typical Residential Small Drain Near Westward County Beach (ID #MUG433, 4-Inch Diameter)

Figure 2-15. Typical Residential Small Drain Near Westward County Beach (ID #MUG437 & 438, 4-Inch Diameters)

Figure 2-16. Typical Residential Small Drain Near Westward County Beach (ID #MUG393, 4-Inch Diameter)

2.8 ASBS 24 Pollution Prevention Plan Map

A Pollution Prevention Plan Map for the ASBS 24 watershed area is included in Appendix A. The map has been created and can be updated using Environmental Systems Research Institute® (ESRI) ArcMap 10. This map shows the 409 identified potential discharge sources within the Parties' jurisdiction to ASBS 24. Section 2.5 contains a detailed description on the original source of this list of locations. Of the total, 26 are associated with the County, with nine located at Nicholas Canyon County Beach and 17 at Zuma Beach. The remaining 383 identified potential discharge sources are small drains ranging in size from 1 to 12 inches that originate from private residential parcels or other properties and terminate along the beach of ASBS coastline, typically at the bottom of the bluffs in either rocky or sandy beach areas.

Some of the drains identified by the Pollution Prevention Map may no longer be in service or may not be configured to discharge to the receiving water. The map also shows the storm water conveyances and other storm drain features associated with surface drainage of storm water runoff, including catch basins, inlets/outlets, outfalls, storm drain lines, channels, and creeks. The map identifies core monitoring stations and shows the location of other outfalls greater than 18 inches that are private, state, or federal owned and not monitored by the Parties. Drainage areas for the core monitoring stations, areas of potential sheet flow, the planned Broad Beach Road biofiltration (BMPs), watershed sub-basins, and flow directions within these sub-basins are depicted, as well as the overall ASBS 24 watershed area. The map also includes the locations of waste and hazardous material storage areas, sewage conveyances and treatment facilities, landslide zones, and roads. Jurisdictional boundaries for the unincorporated area of the County, City, and State, and Federal lands within these areas are shown. This subsection of the Pollution Prevention Plan provides information regarding the Pollution Prevention Plan Map datasets and the procedures for updating applicable GIS files and the map.

2.8.1 Pollution Prevention Plan Map Files

The Pollution Prevention Plan Map includes several types of files, organized by file type, in the following folders:

- MXD – MXD files are the map documents produced in ESRI ArcMap. An MXD contains the map template (e.g., size, layout) and calls upon ESRI GIS shapefiles that are stored in the Shapefiles folder. The MXD contains a table of contents, text, and graphic elements, and specifies how data will be displayed. The MXD establishes relative file paths to the shapefiles. Currently, the MXD folder contains only one file: Compliance_Plan_Map.MXD. Additional versions of the map can be saved in this folder, as needed.

- Shapefiles – Shapefiles are GIS format data files that are called upon by the map. Changes to shapefiles will be reflected in the map if the map calls upon the data stored in the shapefile. A spreadsheet listing all of the shapefiles, contents, and sources is provided as Table 2-3.

- Data Files – Data files contain MS Excel spreadsheets, including those added as tables to the MXD. Changes to MS Excel files do not update the map. New or revised tables must be added to the MXD, and can be used to create XY events (based on latitude and longitude data in the table), or joined to existing shapefiles through a common field ID to order to append additional data fields to the GIS features.

Table 2-3 lists the GIS shapefiles used in the Pollution Prevention Plan Map by filename, and provides GIS feature types (e.g., points, lines, polygons), descriptions of the contents of the GIS file, information regarding the original source, and how to update the data in the Pollution Prevention Plan Map as needed. The file order in this table is based on the order of the items in the map legend (Figure 2-17).

2.8.2 Pollution Prevention Plan Map Update Procedures

Update procedures are provided for each GIS shapefile on Table 2-3 and are dependent upon original source and other considerations. The original source GIS files were provided by LACDPW and the City in GIS shapefile format; therefore, files have been maintained in shapefile format (i.e., not converted to geodatabase format). As these base data layers are updated by the County or City in their primary GIS database, the revised GIS files can be copied to the local Pollution Prevention Plan Map dataset, processed, and used to replace the older file versions. The City and County/District Outfall Stations (and Other Outfalls) locations are maintained in separate shapefiles such that this information can be updated independently by each party and then reinserted into the GIS database without overwriting another Parties' information. If the new filename is the same as the previous version, the new data should display within ArcMap when the file is replaced in the Shapefile folder. However, if the data attribute options have been updated, the symbology for the data layer should be checked in the table of contents to ensure that all values have a symbol and will be drawn. If the map layer does not display (i.e., a red exclamation point will appear in the table of contents next to the filename), check the data source file path and update as needed. GIS shapefiles should be clipped to the overall ASBS watershed area (GIS file), and geometry recalculated to update line lengths and polygon areas. All GIS data should be maintained in the following projected coordinate system: CA State Plane, Datum NAD83, Zone V, units Survey Feet for consistency.

In addition, GIS files can be edited within ESRI ArcMap to update map features and attribute data, such as a change in monitoring stations, a revision to the monitoring station catchment areas, or the addition of monitoring data results. This process can be performed in an edit session using the Editing toolbar. Note that map labels on the map are currently static (i.e., have been converted to annotation stored in the map) to better control their placement. Therefore, text labels will need to be created for new features that are added to existing shapefiles or for new shapefile features for which map labeling is appropriate.

Facilities with hazardous material storage areas should be updated on an annual basis by requesting the Active Facility Inventory List from LA County Fire for Zip Code 90265. The address information can be formatted in an MS Excel spreadsheet for the geocoding process. After adding the table to ArcMap, run the geocoder tool, and clip the resulting shapefile to the ASBS 24 watershed area.

Updates can also be made to the MXD, such as adding new features layers, revising the layout, or other map template items to change the look of the map. New GIS files can also be easily added to the map as additional data become available related to compliance activities. Note that the map legend is static and will not automatically update when new GIS files are added to the MXD. The legend can be manually updated using the drawing and text tools or a new legend inserted. An MXD can be saved as a new file to maintain previous versions in the database.

Table 2-3. GIS Shapefiles Used in Pollution Prevention Plan Map

Filename	GIS Feature Type	Description	Original Source	To Update
County_Disharge_Source_Locations	Point	Potential discharge sources within County's jurisdiction.	Appendix 5 (apx05_drainages.xls) of *Program Final Environmental Impact Report, SCH# 2011012042, Exception to the California Ocean Plan for Areas of Special Biological Significance Waste Discharge Prohibition for Storm Water and Nonpoint Source Discharges, with Special Protections.* February 21, 2012. Available at: http://www.swrcb.ca.gov/water_issues/programs/ocean/asbs.shtml Excel file was filtered to identify only those drainages to ASBS 24 within the County and City's jurisdiction.	Locations and attribute information can be edited in GIS or a new table imported into GIS.
Private_ Discharge_Source_Locations	Point	Potential discharge sources within City's jurisdiction and are small drains (1 to 12 inches) from private parcels.	Appendix 5 (apx05_drainages.xls) of *Program Final Environmental Impact Report, SCH# 2011012042, Exception to the California Ocean Plan for Areas of Special Biological Significance Waste Discharge Prohibition for Storm Water and Nonpoint Source Discharges, with Special Protections.* February 21, 2012. Available at: http://www.swrcb.ca.gov/water_issues/programs/ocean/asbs.shtml Excel file was filtered to identify only those drainages to ASBS 24 within the County and City's jurisdiction.	Locations and attribute information can be edited in GIS or a new table imported into GIS.
LAC_ASBS24_Outfalls	Point	County and District Monitoring Stations in ASBS 24 Monitoring Program, including Core MS4 Outfalls, Outfalls that have Caltrans Inlets but undetermined ownership of Outfalls (not monitored) and Ocean Receiving Water Stations, and creek reference station. Includes ownership information.	Core Monitoring Stations provided by LACDPW in table format and imported into GIS from an MS Excel spreadsheet using latitude and longitude data provided in file to map locations.	Station locations and attribute data can be edited in GIS to update file (i.e., add, remove, or change location or attribute data associated with monitoring stations).
City_ASBS24_Outfalls	Point	Outfalls identified for the City's ASBS 24 Monitoring Program. City has jurisdiction of inlets but outfalls were determined by City to be privately owned. Three of these eight Outfalls are monitored, and five are considered inaccessible. Includes the City's Ocean Receiving Water station.	Field notes in an MS PowerPoint file provided by the City. GIS file created using latitude and longitude data. Other outfalls ≥ 18 inches that were listed in the field notes but not included in monitoring program are provided in file called "Other_Outfalls_City_Recon".	Edit or replace GIS file as needed to add, remove, or change location or attribute data associated with monitoring stations.
Other_Outfalls_County_Recon	Point	This file contains outfalls that were identified in field reconnaissance activities by the County for which ownership is private or undetermined. These outfalls are not in the monitoring program. Not all outfalls were visible or could be verified.	Provided by LACDPW in table format and imported into GIS from an MS Excel spreadsheet using latitude and longitude data fields provided in file.	Station locations and attribute data can be edited in GIS to update file. This file complements the LAC_ASBS24_Outfalls file as the outfalls ≥ 18 inches but not in County monitoring program as ownership is private or undetermined.
Other_Outfalls_City_Recon	Point	This file contains outfalls that were identified in field reconnaissance activities by the City of Malibu and were determined to privately owned and were not included in the monitoring program. Not all outfalls were visible or could be verified.	Field notes in an MS PowerPoint file provided by the City. Tabular data imported into GIS using latitude and longitude data from field notes.	Station locations and attribute data can be edited in GIS to update file. This file complements the City_Outfalls that were also identified in the City recon activities, found to be privately owned but chosen for compliance monitoring .
Catchbasins_ws	Point	Catch basin locations within the ASBS 24 watershed area. Ownership or maintenance of catch basins given in file as: LACFCD for District, City, RMD or not listed (blank).	Based on integrating data from two different catch basin files and removing duplicates. One file provided by LACDPW (used as primary data source), the other found on LA County GIS data portal (supplementary).	Replace GIS file with updated one (LACDPW source) as available and clip to the ASBS 24 watershed boundary. Record catch basin cleaning frequency attribute data.
Inlet_Outlet_from_LADPW_ws	Point	Inlet and outlet locations clipped to ASBS 24 watershed.	Provided by LACDPW. Feature type (inlet or outlet) attribute data was blank, so features could not be symbolized differently.	Replace GIS file with updated one (LACDPW source) as available and clip to the ASBS 24 watershed boundary. Improve data by completing data fields.

Table 2-3. GIS Shapefiles Used in Pollution Prevention Plan Map

Filename	GIS Feature Type	Description	Original Source	To Update
City_inlets_ASBS_Drainage	Point	Point locations for inlets identified by the City as owned by the City.	Table provided by the City.	Locations and attribute information can be edited in GIS or a new table imported into GIS.
Lateral_Lines_SD_from_LADPW_ws	Line	Lateral line storm drains clipped to ASBS 24 watershed.	Provided by LACDPW.	Replace GIS file with updated one (LACDPW source) as available and clip to the ASBS 24 watershed boundary.
Gravity_Main_SD_from_LADPW_ws	Line	Storm drain mains clipped to ASBS 24 watershed.	Provided by LACDPW.	Replace GIS file with updated one (LACDPW source) as available and clip to ASBS 24 watershed boundary.
Storm_Drains_LADPW_clip_ws	Line	Includes pipes, channels, and creeks that convey storm water runoff clipped to the watershed boundary.	LA County GIS data portal.	Replace GIS file with updated one (LACDPW source) as available and clip to the ASBS 24 watershed boundary.
BMP_Areas	Polygon	Shows structural BMPs that can be mapped, and currently displays the Planned Biofiltration BMP at Broad Beach Rd. Does not include non-structure BMPS or Operations and Maintenance Activities (See compliance plan for details).	Based upon project boundary shown in Biofiltration Project report.	Edit or replace GIS file as needed to add, remove, or change location or attribute data associated with these features.
Prelimin_drain_areas_core_mon_outfalls	Polygon	Catchment areas delineated for the Core Monitoring Stations.	Delineated based on desktop data review using 2-ft. contour data, sub-basins, and storm drain data. Not field-verified and should be considered preliminary.	Catchment areas and attribute data can be edited in GIS to update file. New drainage areas will need to be delineated as stations are added.
ASBS_24_Watershed	Polygon	An overall boundary watershed based on the eight watersheds that drain to the ASBS 24 area.	Based on sub-basins GIS file from LACDPW with internal boundaries dissolved for the eight watersheds.	Edit boundary in GIS as needed.
Subbasins_ws	Polygon	Watershed sub-basins clipped to the ASBS 24 watershed boundary	Provided by LACDPW.	Replace GIS file with updated one (LACDPW source) as available and clip to the ASBS 24 watershed boundary.
Subbasins_flow_dir_ws	Line	Watershed sub-basins clipped to the ASBS 24 watershed boundary.	Provided by LACDPW.	Replace GIS file with updated one (LACDPW source) as available and clip to the ASBS 24 watershed boundary.
Areas_potential_sheet_flow	Polygon	Areas identified as having potential sheet flow are the parking lots at Nicholas Canyon, Zuma, and Westward Beaches.	Parking lot areas were digitized from aerial imagery to create the polygon file.	Edit or replace GIS file as needed to add, remove, or change location or attribute data associated with these features.
Sewer_Treatment_Plant_ws	Point	Sewer treatment plant locations within the ASBS 24 watershed area.	Provided by LACDPW.	Replace GIS file with updated one (LACDPW source) as available and clip to the ASBS 24 watershed boundary.
Sewer_Pump_Station_ws	Point	Sewer pump station locations within the ASBS 24 watershed area.	Provided by LACDPW.	Replace GIS file with updated one (LACDPW source) as available and clip to the ASBS 24 watershed boundary.
Sewer_Pipe_ws	Line	Sewer pump station locations within the ASBS 24 watershed area.	Provided by LACDPW.	Replace GIS file with updated one (LACDPW source) as available and clip to the ASBS 24 watershed boundary.
Sewer_Maintenance_Service_Area_ws	Polygon	Sewer maintenance service area within the ASBS 24 watershed area.	Provided by LACDPW.	Replace GIS file with updated one (LACDPW source) as available and clip to the ASBS 24 watershed boundary.
Pacific_Coast_Highway_ws	Line	Centerline feature of PCH (State Hwy 1) extracted from CAMS 2011 GIS file and clipped to the ASBS 24 watershed boundary.	LA County GIS data portal: http://egis3.lacounty.gov/dataportal/2011/12/09/2011-la-county-street-centerline-street-address-file/.	As updated versions of file become available, extract PCH lines from the new shapefile and clip to the ASBS 24 watershed.

Table 2-3. GIS Shapefiles Used in Pollution Prevention Plan Map

Filename	GIS Feature Type	Description	Original Source	To Update
Roads_ws	Line	Non-private road centerline features extracted from the CAMS 2011 GIS file and clipped to the ASBS 24 watershed boundary.	LA County GIS data portal: http://egis3.lacounty.gov/dataportal/2011/12/09/2011-la-county-street-centerline-street-address-file/.	Replace road file with updated versions as available and clip to the ASBS 24 watershed.
Facilities_with_haz_materials	Point	Geocoded addressed for facilities that generate or store hazardous materials within the ASBS 24 watershed.	Facility addresses provided by LA County Fire Dept in MS Excel spreadsheet.	Request the annual update of Facility (Active) Inventory List from LA County Fire for Zip Code 90265. Format address data in MS Excel spreadsheet for geocoder. Geocode in ArcMap and clip the shapefile to the ASBS24 watershed.
County_Bndry	Polygon	Boundary of the County.	Los Angeles County GIS Data Portal.	No update expected.
Jurisdictional_Boundary_ws	Polygon	Jurisdictional boundaries for the unincorporated portion of the County and the City clipped to the ASBS 24 watershed.	Los Angeles County GIS Data Portal.	Replace GIS file with updated one (LACDPW source) as available and clip to the ASBS 24 watershed boundary.
State_and_Federal_Lands_ws	Polygon	Land areas identified as in state or rederal ownership clipped to the ASBS watershed area.	Based on parcels in state or federal ownership extracted from Parcel GIS data file provided by LACDPW.	Process updated parcel file (LACDPW source) to extract parcels with state or federal ownership; dissolve boundaries by owner type/code; clip to the ASBS 24 watershed boundary.
ASBS_24_Boundary	Polygon	ASBS 24 watershed boundary.	CA State Water Resources Control Board.	To be updated only if boundary is changed. Replace GIS file if new one is published by agency.
USGS_Landslides_zone_clipped_ws	Polygon	Landslide zones for 1:24k USGS sheets of Point Dume and Trifuno Pass merged into a single GIS file.	Provided by the City, available from USGS.	Update GIS file as new data are published by USGS or if County revises data based on landslide activity.

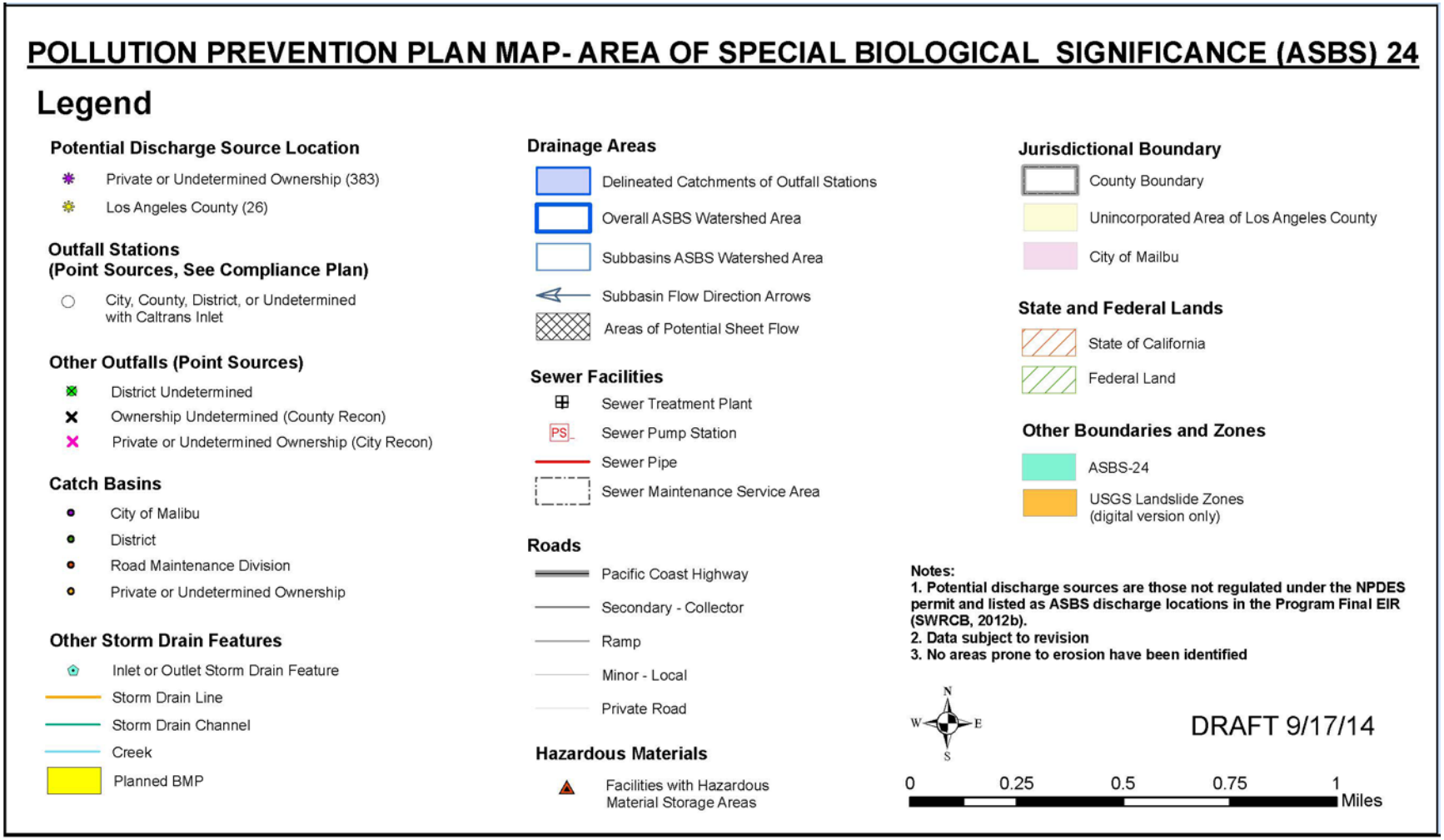

Figure 2-17. Pollution Prevention Plan Map Legend

3.0 DRY WEATHER COMPLIANCE

Section I.A.2.b of the General Exception states that the ASBS Pollution Prevention Plan will describe measures taken by the Parties to eliminate non-authorized, non-storm water runoff (e.g., dry weather flows), how these measures will be maintained over time, and how these measures are monitored and documented (SWRCB, 2012a).

3.1 Nonstructural Controls

When used in combination, nonstructural controls have been proven to provide improved effectiveness in load and flow reduction, at a lower cost, than many structural solutions (Brown et al., 2010; Pohl, 2010; Cac and Ogawa, 2010; Krieger et al., 2010). The Parties have implemented nonstructural control measures that are designed to eliminate non-authorized, non-storm water runoff, to meet the requirements of the General Exception and Special Protections of the California Ocean Plan (SWRCB, 2012a). These control measures include public information and participation programs (PIPPs), operations and maintenance (O&M) programs, and enforcement programs. A discussion of the Parties' use of each of these types of nonstructural BMPs follows, and a list of existing programs is provided in Appendix B.

3.1.1 Nonstructural Program Terms and Definitions

Nonstructural programs are designed to prevent pollution generation; control sources of pollution once generated; and eliminate the true source of pollutants. The following common terms and definitions are related to nonstructural controls, which are used throughout the document, including:

- Pollution Prevention Measures target pollutants and wastes before they are generated. These measures typically emphasize conserving or reusing resources to prevent pollution.
- Source Controls target specific sources of pollution to reduce or eliminate pollutants before they enter the municipal separate storm sewer system (MS4) and / or ultimately the receiving water. Source controls may include institutional controls (e.g., codes, ordinances, and regulations), outreach, education, incentive programs, and enforcement measures.
- True Source Controls recognize that the source pollutant may be the physical design of a product, such as copper-based pesticides or copper break-pads. In this instance, product regulation and true source control can only be achieved at the state or national level. True source controls support regulatory change outside the local jurisdiction.

Nonstructural programs have been classified in this document using a "three-legged stool" approach where the three legs of the stool consist of PIPPs, Enforcement Programs, and O&M Programs (see Figure 3-1). When used in combination, nonstructural controls have been proven to provide improved effectiveness in load and flow reduction, at a lower cost, than many structural solutions (Brown et al., 2010; Pohl, 2010; Cac and Ogawa, 2010; Krieger et al., 2010).

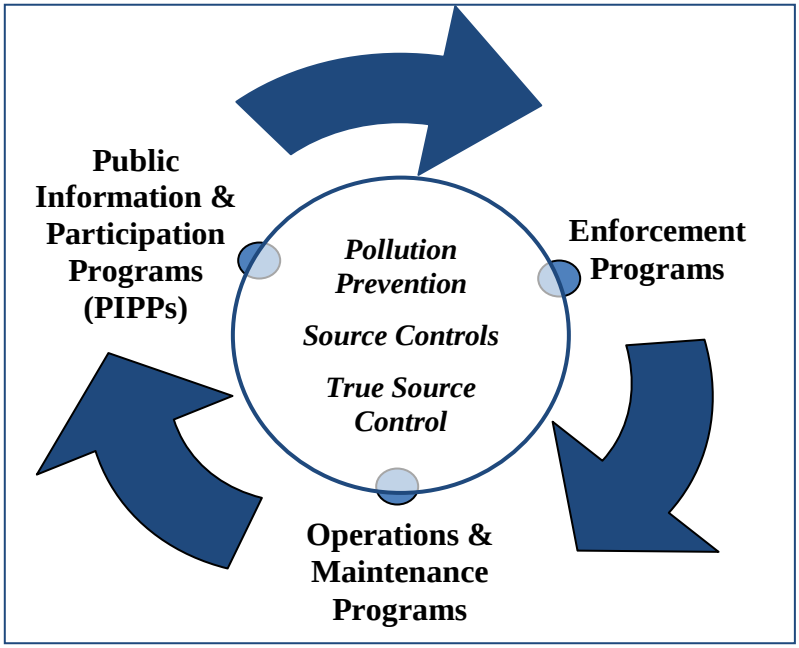

Figure 3-1. ASBS 24 Nonstructural Programs

While not an explicit pollution prevention measure or source control, special studies are another important aspect of nonstructural programs. Special studies are needed to fill the gaps in knowledge about pollutants of concern, pollutant sources, pollutant transport to the receiving water, and the evaluation of the effectiveness of existing and planned solutions. Special studies are necessary to ensure that compliance activities are designed and located based on scientifically sound data.

3.1.2 Nonstructural Program Adaptive Management Process

The ASBS 24 PIPPs, enforcement, and O&M nonstructural programs have been implemented using adaptive management (Figure 3-2) to plan, implement, assess, and refine individual nonstructural controls. Nonstructural programs implemented to date have ensured compliance with the zero dry weather discharge criteria of the Special Protections. Receiving water data collected under the 2013 Regional Monitoring Program represent the initial assessment of wet weather loading to ASBS 24. Some nonstructural programs have been implemented to date, as identified in this document, and have the potential to help reduce wet weather pollutant loads. Effectiveness assessments will play a key role in ongoing implementation of the nonstructural program by identifying the optimal enhanced programs and establishing a process for planning subsequent phases of nonstructural implementation.

Figure 3-2. Adaptive Management Process

3.2 Existing Nonstructural Programs

The Parties proactively participate in regional nonstructural planning efforts and implement nonstructural controls to protect the receiving water quality of ASBS 24. A detailed list of existing PIPPs, enforcement programs, and O&M programs is provided in Appendix B. This section contains a description of key nonstructural programs related to compliance with the prohibited discharges listed in the General Exception.

3.2.1 Public Information and Participation Programs

PIPPs encompass the education, outreach, and rebate / incentive programs implemented by the Parties that encourage positive behavior changes which eliminate or reduce potential polluting behaviors, encourage reporting and cleanup of discharges, and reduce water consumption. Waste management and water conservation PIPPs have been implemented by the Parties and are described in the following sections.

3.2.1.1 Waste Management PIPPs – Outreach Programs

Clean LA is the County's main PIPP. Clean LA offers online and hotline resources to residents, businesses, and local governments that answer questions related to household hazardous and electronic waste collection, composting, recycling, illegal dumping prevention, and water quality impacts of proper waste management. The Clean LA hotline, which is shared with the District, fielded 34,064 calls throughout the County during the fiscal year covered under the 2011-2012 Annual Report (LACDPW, 2012a). Within the Clean LA tool box, the Rethink LA program encourages "rethinking" about opportunities to implement reduction, recycling, and reuse, and offers the Los Angeles County Materials Exchange (LACoMAX) as a unique Web platform for buying recycled products, exchanging materials, and advertising garage sales (LACDPW, 2014). These online educational resources are interlinked and represent the types of programmatic tiering possible within a PIPP.

Similarly, the Malibu Green Room Web page, a one-stop resource for all things "green" in the City, is one of the City's key PIPP resources. The Web page includes information related to environmental protection ordinances, the City's 24-Hour Pollution Prevention Hotline (initiated in June 2012), special waste collection events, the ocean friendly gardens (OFG) and California (CA) Friendly Landscapes programs and examples of properties where such gardens are installed, design and implementation of structural BMPs, and environmental events, as well as examples of what actions the City has taken to become more sustainable. This Web page is linked with other City-managed Web pages, such as the ASBS Web page, the *Keep it Clean, Malibu* campaign and projects and programs offered by partner agencies (City, 2014).

3.2.1.2 Water Conservation PIPPs – Incentive Programs

Three incentive programs are managed regionally by the Los Angeles County Waterworks and West Basin Municipal Water District and are advertised within the ASBS 24 watershed by the County and City. The programs are used to encourage water conservation for outdoor landscaping, thereby preventing dry weather runoff to ASBS 24 from over-irrigation. These

programs vary based on available funding, but have included incentives such as the Landscape Irrigation Efficiency Program (LIEP), which offered installation of free efficient sprinkler heads and an irrigation efficiency evaluation at qualified properties; the Water Saving Devices Rebate Program, a residential rebate program for water-saving devices such as rotary sprinkler nozzles and irrigation controllers; and Cash for Grass, a residential rebate program for replacing grass with water-efficient landscaping.

3.2.1.3 Water Conservation PIPP – Surfrider Ocean Friendly Garden Program

The Surfrider Ocean Friendly Garden (OFG) Program is a regional effort to promote water conservation and eliminate dry weather runoff from over-irrigation and other anthropogenic sources. The County and City manage web pages identifying OFG "case studies" within their jurisdiction and frequently host educational and outreach events at OFGs located at public facilities (Surfrider, 2012). Recently, the City has also been promoting the Metropolitan Water District-funded California Friendly Landscapes program, which is a reimagining of the OFG program intended to engage a broader audience who might not otherwise resonate with the concept of "ocean friendly".

3.2.1.4 Water Conservation PIPP – City of Malibu ASBS Focused Outreach Program

The City of Malibu Focused ASBS Outreach Program included a Coastal Preservation Specialist (CPS) position that was created by the City under a State Proposition 84 grant to perform direct and focused outreach to residents and to develop an outreach campaign to reach the community at large raising awareness of ASBS 24. One of the roles of the CPS was to develop and implement PIPPs that prevent dry weather flows. The CPS mailed a general ASBS education letter to every parcel within the ASBS and regularly gave public educational and school presentations on ASBS topics such as OFGs and water conservation, which may be implemented by residents and are being implemented by the City. Additionally, the CPS attended public events to educate about protecting the ASBS. As the City's representative, the CPS interfaced with schools for environmental education programs with Pepperdine University and Point Dume Marine Science School, and Malibu High School. The CPS also developed new ASBS content and maintained pages on the City's web page, interfaced with the media, and expanded the City's outreach of ASBS topics using social media platforms including Facebook, Twitter, and Instagram. The *Keep it Clean, Malibu* website further enhanced the City's ASBS content and encourages residents to prevent pollution by providing guidance on the proper use of common products and best practices relating to other sources (e.g., pet waste).

In addition, ASBS 24 coastline and inland areas that could be tributary to it were regularly patrolled by the CPS, who looked for dry-weather runoff and other pollution threats in the coastal and inland areas. County staff routinely coordinated with the CPS by reported over irrigation. When individual properties were identified as non-compliant with ASBS regulations, such as due to over-irrigation, they were mailed educational materials and a cease-and-desist letter. The CPS personally engaged with these property owners and residents by providing education on the potential impacts to the ASBS and tailoring solutions to the property.

As part of the Proposition 84 State funding, the CPS was tasked with developing an outreach campaign to educate people about the issue and the result was *Keep it Clean, Malibu* – a multi-

platform educational campaign designed to positively, proactively make people think about storm drains and what goes into them. The campaign contains five main elements:

1. A series of four Public Service Announcements starring a beautiful urban mermaid coming into contact with the pollutants we create on land.
2. A series of four storm drains painted by a local artist to draw attention to the drains and their connection to the ocean. A video highlighting the making of this artwork was also created.
3. An active social media campaign on Instagram primarily, but also Facebook and Twitter. Citizens are encouraged to get involved in celebrating the ASBS by posting pictures of the gorgeous marine life in the area.
4. Two special events designed to kick off the campaign and draw attention to the issue – a ribbon cutting ceremony for the storm drain art project and a red carpet premier for the video series, which was held on Earth Day.
5. Distribution of wearable collateral materials (bright blue hats and temporary tattoos) which prominently feature the "Keep it Clean, Malibu" slogan, in effect creating walking billboards of the message.

In addition to these five main elements, the City partnered with local organizations to promote the ASBS campaign messages at their special events and through their websites and social media. These partnerships range from water and energy utilities to schools to business and community groups. The special events included:

1. Pepperdine University Earth Day Fair
2. Earth Day Celebration hosted by Malibu Chamber of Commerce and Malibu Country Mart
3. Rhyming in the Universe Earth Day Celebration hosted by Team United and Malibu Ballet Performing Arts Society
4. Fiesta Malibu hosted by Juan Cabrillo Elementary School

The bright blue hats and temporary tattoos used to promote the *Keep It Clean, Malibu* message were received with enthusiasm. In order to receive a hat, citizens sign an ASBS Pledge to prevent polluted runoff and protect ocean water quality with their daily activities.

Even though the grant-funded outreach project that included the CPS is complete, the City recently added a new position which will assume the outreach and inspections duties of the CPS. The *Keep It Clean, Malibu* campaign and relevant videos may be found at www.keepitcleanmalibu.com and ASBS education in general at www.malibucity.org/ASBS.

3.2.2 Enforcement Programs

Enforcement programs supporting environmental ordinances passed by the County and City are intended to eliminate non-authorized flows as defined in the General Exception, control illicit discharges, provide sediment and erosion control for construction sites, verify NPDES and ASBS compliance, and implement appropriate education and enforcement in response to runoff, trash, and other greening efforts. Existing enforcement programs within the area draining to ASBS 24 include the LACDPW and City illicit connection/illicit discharge (IC/ID) elimination programs,

LACDPW and City construction programs, the City's commercial and industrial (should an industrial facility begin operating; there are currently none in the City of Malibu) business inspection program, and City enforcement of violations observed while implementing the Clean Bay Restaurant certificate program (discussed in further detail later in this document). The Pollution Prevention Plan assessment area is limited to potential discharge source locations not regulated under the NPDES permit, which, in general, includes private drains and areas within parking lots where sheet flow collects and flows onto beach sand. The aforementioned enforcement programs are applicable to potential discharge of non-authorized flows from both NPDES permit regulated and non-regulated sources. Where non-authorized flows would reach an MS4 regulated under the NPDES permit, applicable programs are discussed in the Compliance Plan (e.g., IC/ID). This Plan focuses on applicable enforcement programs specific to potential discharge sources not regulated under the NPDES permit.

3.2.2.1 Water Conservation Enforcement – City of Malibu ASBS Focused Outreach Program

As previously described, as part of the City of Malibu ASBS Focused Outreach Program, ASBS 24 was regularly patrolled by the CPS who looked for dry-weather runoff and other pollution threats in the coastal and inland areas. When individual properties were identified as non-compliant with ASBS regulations, such as due to over-irrigation, they are mailed educational materials and a cease-and-desist letter. Each of these property owners were personally engaged to correct the issue by providing education on the potential impacts to the ASBS and custom tailoring solutions to the property. The CPS was funded by a Proposition 84 grant that continued through July 2014. Even though the grant-funded outreach project that included the CPS is complete, the City recently added a new position which will assume the outreach and inspections duties previously performed by the CPS.

3.3 Dry Weather Assessment of Discharge Source Discharges

As discussed in this Plan (see Section 2.5), the SWRCB prepared a Program Final Environmental Impact Report that included, as an appendix, a list of ASBS potential discharge locations. Of the total 409 identified potential discharge sources within the Parties' jurisdiction (SWRCB, 2012b), 26 are associated with the County with nine located at Nicholas Canyon County Beach and 17 at Zuma Beach. Some of the drains may no longer be in service or may not be configured to discharge to the receiving water.

Nicholas Canyon County Beach is located south of Leo Carrillo State Beach and has six identified potential discharge sources that include a storm drain pipe connected to three inlets in the asphalt concrete parking, drains originating from private residences, and sheet flow discharge from Nicholas Beach Road. Zuma and Westward County Beaches are located south of Broad Beach and north of Point Dume. The beaches include 12 parking lots located between the Pacific Coast Highway and the wide (approximately 200 ft.) sandy beach area. The parking lots are sloped towards 17 low points. At these low points, the curb and sidewalk slope down and are level with the asphalt, allowing runoff to exit the parking lots and flow onto the beach sand. At the County beaches, no irrigation or other sources of dry weather flows are present.

Field reconnaissance was performed on the accessible areas along the ASBS 24 coast to determine the accuracy of the SWRCB list of small drains. The accessible areas included north

of the La Piedra State Beach, Westward County Beach, Dume Cove, Little Dume, and Paradise Cove areas. Although the drain locations and sizes of all the drains in the areas where reconnaissance visits were performed did not match exactly those listed in the SWRCB reference, the overall total number of pipes and their sizes, in general, did correspond to the SWRCB list.

4.0 RECEIVING WATER ASSESSMENT

A determination of whether there is currently an exceedance of the natural water quality of the ASBS is the first step in the process of assessing the pollutant load reductions targets required to enhance the water quality of the ASBS. Wet weather receiving water quality monitoring data results were evaluated in comparison to data for reference monitoring sites, in accordance with the flowchart provided as Attachment 1 to the General Exception, to determine if an exceedance of the natural water quality currently exists.

4.1 Determination of Compliance with Natural Water Quality

In 2008, a study was conducted as part of Bight 2008 to assess water quality in southern California ASBS (Schiff et al., 2011). The study was designed to evaluate the range of natural water quality near reference drainage locations and to compare water quality near ASBS discharges to these natural water quality conditions. Additional reference monitoring was performed under the Regional Monitoring Program. During the development of this draft Pollution Prevention Plan, compliance with natural water quality was determined by comparing receiving water data from wet weather monitoring recently conducted for ASBS 24 to the 85th percentile threshold of reference sample concentrations measured during Bight 2008 and Bight 2013.

Concentrations of pollutants in post-storm receiving water were compared to those in pre-storm receiving water and to the 85th percentile threshold of reference sample concentrations. When post-storm receiving water concentrations are greater than the 85th percentile threshold and are greater than pre-storm concentrations, results from the next storm are analyzed. If post-storm receiving water concentrations are again greater than the 85th percentile threshold and pre-storm concentrations, the constituent(s) are classified as exceedances of natural water quality. Concentrations of TSS, ammonia, nitrate, total orthophosphate, and total metals were compared to the 85th percentile thresholds.

Wet weather monitoring was performed by LACDPW at two receiving water locations: (1) S01, located off Zuma Beach directly out from ASBS-016, a 60-inch storm drain; and (2) S02, located off Escondido Beach, directly out from ASBS-028, a 36-inch storm drain. Monitoring was conducted during storm events occurring on February 19 and March 8, 2013, and February 28, 2014. Wet weather flows from ASBS-016 only reached the ocean receiving water at S01 during the February 28, 2014, monitored event. The City performed monitoring at receiving water Site 24-BB-03R. For safety reasons, this site was only sampled during the February 28, 2014, event. Therefore, the assessment of compliance with natural water quality was primarily performed for receiving water station S02, which had samples collected during three wet weather events. Receiving water station S02 is considered to be representative of the typical to worst case scenario of the potential impact that storm water runoff may have on the water quality within the ASBS based on being located adjacent to development that is typical to more dense in comparison to urban development along other parts of the ASBS. Figure 4-1 shows the locations of the receiving water stations monitored in support of the preparation of this Plan.

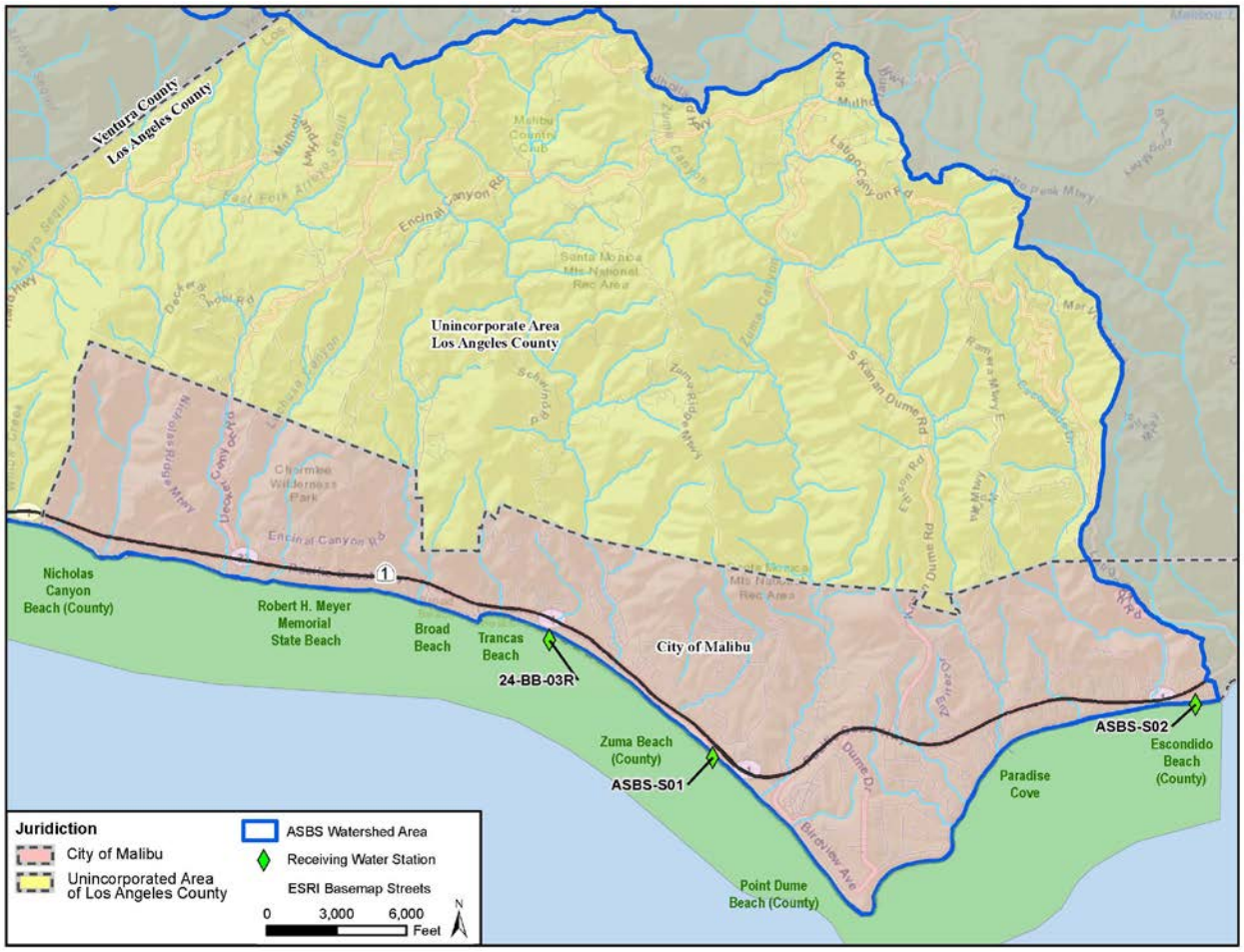

Figure 4-1. ASBS 24 Receiving Water Monitoring Locations

4.1.1 February 19, 2013, Storm Event Receiving Water Monitoring

The February 2013 storm event resulted in approximately 0.12 inches of rainfall based on rain gauge data obtained from County Fire Station 70 located at 3970 Carbon Canyon Road in Malibu, CA. Receiving water results were compared to the available list of constituents of reference site 85th percentile values. Post-storm concentrations of nitrate as nitrogen (N), selenium, total PAHs, and total pyrethroids were greater than the 85th percentile threshold (see Table 4-1). However, the nitrate as N post-storm concentration was less than the pre-storm concentration; therefore, the nitrate as N concentration is considered to be similar to background concentrations and is not classified as an exceedance. Since the selenium, total PAHs, and total pyrethroids concentrations were greater than the 85th percentile threshold and were greater than pre-storm concentrations, results from the proceeding storm event were analyzed to determine whether the natural water quality has been exceeded.

For constituents that are summed to get total values for comparison to 85th percentile total values (e.g., all OP pesticides, total PAHs, total pyrethroids), half of the method detection limits (MDL) were used for non-detect values. In the case of total pyrethroids for example, the reference sampling resulted in all non-detect values, and therefore the summation of the MDLs for the 10 selected pyrethroids is 6.75 µg/L. Following this process to determine total pyrethroids for the

ASBS 24 receiving water stations results in an exceedance of 85th percentile threshold value anytime a pyrethroid included in the assessment has a measurable result (i.e., 85th percentile threshold in reality is zero). In actuality, the individual pyrethroid values may be less than half the MDL values (undetermined currently based on laboratory limitations) resulting in the possibility that the total pyrethroid value is less than the 85th percentile threshold. The same is true for both all OP pesticides and total PAHs assessments.

Table 4-1. February 2013 Receiving Water Results

Parameter	Units	85th Percentile of Reference Data	S01-PRE 2/18/2013	S02-PRE 2/18/2013	S02-POST 2/19/2013
General Chemistry					
Ammonia as N	mg/L	0.015	0.09	0.04J	<0.02
Nitrate as N	mg/L	0.374	0.51	0.38	0.25
Oil & Grease	mg/L	0.5	14.1	<1	<1
Total Orthophosphate as P	mg/L	0.114	0.02	0.02	0.03
Total Suspended Solids	mg/L	55.4	5.2	7.9	40.5
Total Metals					
Arsenic (As)	µg/L	`	1.718	1.471	1.393
Cadmium (Cd)	µg/L	0.16	0.0229	0.0601	0.058
Chromium (Cr)	µg/L	2.6	0.3192	0.5437	0.6366
Copper (Cu)	µg/L	1.9	0.149	0.321	0.454
Lead (Pb)	µg/L	0.72	0.0513	0.102	0.1867
Mercury (Hg)	µg/L	0.0006	<0.0012	<0.0012	<0.0012
Nickel (Ni)	µg/L	2.2	0.2724	0.509	0.7661
Selenium (Se)	µg/L	0.017	0.007J	0.015	0.031
Silver (Ag)	µg/L	0.08	0.03	0.01J	<0.01
Zinc (Zn)	µg/L	19	1.0376	1.2033	12.2809
Organophosphorus Pesticides					
*All OP Pesticides	ng/L	6	6	6	6
Polynuclear Aromatic Hydrocarbons					
*Total PAHs	ng/L	12.5	12.5	12.5	41.1
Pyrethroids					
Bifenthrin	ng/L		<0.5	<0.5	<0.5
Deltamethrin/Tralomethrin	ng/L		<0.5	<0.5	<0.5
Esfenvalerate	ng/L		1.1J	<0.5	0.8J
All Other Pyrethroids	ng/L		ND	ND	ND
*Total Pyrethroids	ng/L	6.75	8.6	6.75	7.3

< - results less than the method detection limit.
ND - results less than the MDLs (multiple MDL values).
J - Analyte was detected at a concentration below the reporting limit and above the method detection limit. Reported value is estimated.
Red outline – Post-storm receiving water concentration is greater than 85th percentile of Reference Data AND greater than pre-storm concentration.
*Totals calculated using result values if above the MDL and half the MDL when results were less than the MDL.

4.1.2 March 8, 2013, Storm Event Receiving Water Monitoring

The March 2013 storm event resulted in approximately 0.74 inches of rainfall based on rain gauge data obtained from County Fire Station 70. The selenium and total PAHs concentrations in

the receiving water were again greater than both the 85th percentile threshold and pre-storm concentrations (see Table 4-2). As a result, the concentrations of both constituents are considered to be exceedances of natural water quality and may be contributing to alterations in natural ocean water quality within ASBS 24. In addition, concentrations of nitrate as N, copper, lead, mercury, zinc, and total PAHs were greater than both the 85th percentile threshold and pre-storm concentrations. Results from the subsequent monitored wet weather event (February 2014) were used to evaluate whether the listed constituents in storm water runoff were considered to be contributing to an exceedance of natural water quality.

The receiving water Site S02 results for the first monitored event (February 2013 event) included a concentration total pyrethroid that was greater than both the 85th percentile threshold and pre-storm concentrations (see Table 4-1). The February 2014 receiving water Site S02 concentration for total pyrethroid was not greater than both the 85th percentile threshold and pre-storm concentrations (see Table 4-2).

Table 4-2. March 2013 Receiving Water Results

Parameter	Units	85th Percentile of Reference Data	S01-PRE 3/6/2013	S02-PRE 3/6/2013	S02-POST 3/8/2013
General Chemistry					
Ammonia as N	mg/L	0.015	0.04J	0.03J	<0.02
Nitrate as N	mg/L	0.374	0.48	0.49	0.54
Oil & Grease	mg/L	0.5	<1	<1	<1
Total Orthophosphate as P	mg/L	0.114	0.03	0.03	0.06
Total Suspended Solids	mg/L	55.4	3.8	14.9	33.3
Total Metals					
Arsenic (As)	µg/L	1.72	1.558	1.563	1.577
Cadmium (Cd)	µg/L	0.16	0.0281	0.0587	0.1396
Chromium (Cr)	µg/L	2.6	0.2422	0.6549	2.5224
Copper (Cu)	µg/L	1.9	0.157	0.378	2.924
Lead (Pb)	µg/L	0.72	0.0288	0.1558	1.0434
Mercury (Hg)	µg/L	0.0006	<0.0012	<0.0012	0.0046J
Nickel (Ni)	µg/L	2.2	0.2849	0.625	1.8595
Selenium (Se)	µg/L	0.017	0.008J	0.017	0.052
Silver (Ag)	µg/L	0.08	<0.01	0.01J	<0.01
Zinc (Zn)	µg/L	19	2.6986	37.8762	54.1039
Organophosphorus Pesticides					
*All OP Pesticides	ng/L	6	6	6	6
Polynuclear Aromatic Hydrocarbons					
*Total PAHs	ng/L	12.5	12.5	12.5	25.5
Pyrethroids					
Bifenthrin	ng/L		<0.5	<0.5	8.4
Deltamethrin/Tralomethrin	ng/L		10.6	26.6	<0.5
Esfenvalerate	ng/L		<0.5	<0.5	<0.5
All Other Pyrethroids	ng/L		ND	ND	ND
*Total Pyrethroids	ng/L	6.75	19.85	35.85	17.65

< - results less than the method detection limit.
ND - results less than the MDLs (multiple MDL values).
J - Analyte was detected at a concentration below the reporting limit and above the method detection limit. Reported value is estimated.
Red outline – Post-storm receiving water concentration is greater than 85th percentile of Reference Data AND greater than pre-storm concentration.
Orange fill – Analyte concentration has exceeded 85th percentile of Reference Data during 1st and 2nd monitoring event.
*Totals calculated using result values if above the MDL and half the MDL when results were less than the MDL.

4.1.3 February 28, 2014, Storm Event Receiving Water Monitoring

The February 2014 storm event resulted in a total event rainfall of approximately 2.26 inches of rainfall based on rain gauge data obtained from County Fire Station 70. Pre- and post-samples were collected at Sites S01, S02, and 24-BB-03R.

The concentrations of total orthophosphate as P, TSS, mercury, selenium, silver, total PAHs, and total pyrethroids in the receiving water at Site S02 were greater than both the 85th percentile threshold and pre-storm concentrations (see Table 4-3). Based on the results from the first and second monitored events in accordance with the General Exception, selenium and total PAHs are considered to be exceedances of natural water quality. The selenium and total PAHs results at Site S02 from the February 2014 event are consistent with those previous data. The mercury result being higher than both the 85th percentile threshold and pre-storm concentration for the second consecutive monitored event is considered to be exceedance of the natural water quality and may be contributing to alterations in natural ocean water quality within ASBS 24. Of the three storms monitored, the February 2014 events results for Site S02 are the only one where orthophosphate as P, TSS, or silver were above both the 85th percentile threshold and pre-storm concentrations. Therefore, the receiving water Site S02 measured concentrations of total orthophosphate as P, TSS, and silver being above both the 85th percentile threshold and pre-storm concentrations during one event are not considered to be exceedances of natural water quality.

The receiving water Site S02 results for the second monitored event (March 2013 event) included concentrations of nitrate as N, copper, lead and zinc that were greater than both the 85th percentile threshold and pre-storm concentrations (see Table 4-2). The February 2014 receiving water Site S02 concentrations for nitrate as N, copper, lead and zinc were not greater than both the 85th percentile threshold and pre-storm concentrations (see Table 4-3), and therefore these constituents are not considered to be exceedances of the natural water quality.

Mercury, silver, zinc, and Total PAHs concentrations in receiving water were greater than both the 85th percentile threshold and pre-storm concentrations for Site S01 (see Table 4-3). This monitored event was the only one of three in which flow from ASBS-016 reached the receiving water at Site S01, and thus, was the only time receiving water chemistry data were obtained at S01 as part of the General Exception monitoring. Based on first and second event results for Site S02, total PAHs is considered to be an exceedances of natural water quality. Based on second and third event results for Site S02, mercury is considered to be an exceedance of natural water quality. The receiving water Site S01 measured concentrations of silver and zinc being above both the 85th percentile threshold and pre-storm concentrations during one event is not considered to be an exceedance of natural water quality.

Pre-storm and post-storm samples were collected and analyzed at Site 24-BB-03R. For safety reasons, this site was not sampled previous to this event. The selenium concentration in the receiving water was greater than both the 85th percentile threshold and pre-storm concentrations for Site 24-BB-03R (see Table 4-3). The concentration of selenium being above the 85th percentile threshold and pre-storm concentrations is not considered an exceedance of natural water quality at Site 24-BB-03R. The selenium result at Site 24-BB-03R above the 85th percentile threshold and pre-storm concentrations are consist with the results for Site S02 where

selenium is considered to be an exceedance of natural water quality based on the first and second event results.

Table 4-3. February 2014 Receiving Water Results

Parameter	Units	85th Percentile of Reference Data	S01-PRE	S01-POST	S02-PRE	S02-POST	24-BB-03R-PRE	24-BB-03R-POST
			2/25/2014	2/28/2014	2/25/2014	2/28/2014	2/25/2014	2/28/2014
General Chemistry								
Ammonia as N	mg/L	0.015	<0.02	<0.02	<0.02	<0.02	ND	ND
Nitrate as N	mg/L	0.374	0.03J	0.02J	0.02J	<0.01	0.04	ND
Oil & Grease	mg/L	0.5	<1	<1	<1	<1	ND	ND
Total Orthophosphate as P	mg/L	0.114	0.02	0.02	0.02	0.18	0.02	0.02
Total Suspended Solids	mg/L	55.4	19.5	25.2	87.7	150	10.8	7.1
Total Metals								
Arsenic (As)	µg/L	1.72	1.472	1.283	6.604	4.122	1.388	1.322
Cadmium (Cd)	µg/L	0.16	0.0249	0.0228	0.5099	0.2623	0.0152	0.022
Chromium (Cr)	µg/L	2.6	1.1131	0.3893	26.0119	4.9578	1.4705	0.6962
Copper (Cu)	µg/L	1.9	0.676	0.221	6.001	2.289	0.167	0.646
Lead (Pb)	µg/L	0.72	0.2367	0.0584	7.265	1.5477	ND	0.2159
Mercury (Hg)	µg/L	0.0006	<0.0012J	0.014	<0.0012	0.0261	ND	ND
Nickel (Ni)	µg/L	2.2	0.8679	0.3565	21.5664	4.2441	0.2951	0.4901
Selenium (Se)	µg/L	0.017	0.016	0.011J	0.083	0.155	0.012	0.026
Silver (Ag)	µg/L	0.08	0.09	0.18	0.03	0.14	0.14	0.12
Zinc (Zn)	µg/L	19	5.3515	21.0509	41.7076	12.0229	2.9144	17.3532
Organophosphorus Pesticides								
*All OP Pesticides	ng/L	6	6	6	6	6	6	6
Polynuclear Aromatic Hydrocarbons								
*Total PAHs	ng/L	12.5	17.4	18.5	29.6	84.1	19.2	18.8
Pyrethroids								
Bifenthrin	ng/L		<0.5	<0.5	<0.5	2.5	<0.5	<0.5
Deltamethrin/Tralomethrin	ng/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Esfenvalerate	ng/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
All Other Pyrethroids	ng/L		ND	ND	ND	ND	ND	ND
*Total Pyrethroids	ng/L	6.75	6.75	6.75	6.75	9	6.75	6.75

< - results less than the method detection limit.
ND - results less than the MDLs (multiple MDL values).
J - Analyte was detected at a concentration below the reporting limit and above the method detection limit. Reported value is estimated.
Red outline – Post-storm receiving water concentration is greater than 85th percentile of Reference Data AND greater than pre-storm concentration.
Orange fill – Analyte concentration has exceeded 85th percentile of Reference Data during 1st and 2nd monitoring event.
*Totals calculated using result values if above the MDL and half the MDL when results were less than the MDL.

4.1.4 Receiving Water Monitoring Conclusions

In post-storm samples collected in the receiving water (Site S02), selenium and total PAHs concentrations were above the 85th percentile reference threshold and had post-storm concentrations that exceeded those of the pre-storm samples collected during three consecutive monitored storm events (February and March 2013 and February 2014) Mercury results at Site S02 were above 85th percentile reference threshold and pre-storm concentrations for two consecutive events (March 2013 and February 2014). Based on the guidance found in

Attachment 1 of the General Exception, this indicates an exceedance of natural water of the ASBS for these constituents.

Receiving water samples (Site S02) collected during the second monitored event had concentrations of nitrate as N, copper, lead, and zinc above the 85th percentile reference thresholds and were above the pre-storm concentrations. Based on Attachment 1 of the General Exception, if these constituents are above the 85th percentile reference thresholds in post-storm receiving water samples collected during the next monitoring event, then there would be an exceedance in the natural water quality of the ASBS for these additional constituents. February 2014 receiving water (Site S02) concentrations for nitrate as N, copper, lead, and zinc were not greater than both the 85th percentile threshold and pre-storm concentrations, and these constituents are not considered an exceedance of natural water quality.

Of the three storms monitored, the only event in which flow from ASBS-016 reached the receiving water at Site S01 was during the February 28, 2014, storm (third monitored event), and thus, was the only time receiving water chemistry data were obtained at S01 as part of the General Exception monitoring. Mercury, silver, zinc, and total PAHs concentrations in receiving water were greater than both the 85th percentile threshold and pre-storm concentrations for Site S01. Based on the Site S02 results from the first and second events, total PAHs is considered to be an exceedance of natural water quality. The receiving water Site S01 measured concentrations of silver and zinc being above both the 85th percentile threshold and pre-storm concentration during one event is not considered to be exceedances of natural water quality.

Pre-storm and post-storm samples were collected and analyzed at Site 24-BB-03R. For safety reasons, this site was not sampled previous to this event. The selenium concentration in the receiving water was greater than both the 85th percentile threshold and pre-storm concentration for Site 24-BB-03R (see Table 4-3). The concentration of selenium being above the 85th percentile threshold and pre-storm concentrations is not considered an exceedance of natural water quality at Site 24-BB-03R. The selenium results at Site 24-BB-03R above the 85th percentile threshold and pre-storm concentrations are consistent with the results for Site S02 where selenium is considered to be an exceedance of natural water quality based on the first and second event results for Site S02.

4.2 Bight 2008 Data for ASBS 24

A review of Bight 2008 ASBS 24 data was conducted, and a summary of the review is provided for reference and for comparison to the determination made in this Pollution Prevention Plan. Bight 2008 constituent concentrations values were obtained from a series of graphs and are approximate (tabular data not currently available). The Bight 2008 effort included collecting and analyzing both reference and discharge receiving water samples. The Bight 2008 report showed the comparison between the reference 85th percentile threshold values and discharge samples (Schiff et al., 2011).

4.2.1 Metals

For total chromium, the Bight 2008 85th percentile threshold of reference conditions was 1.6 µg/L (threshold revised by Bight 2013 data to 2.6 µg/L). Of the five ASBS 24 post-storm

samples assessed for total chromium during Bight 2008, four had concentrations below the threshold (ranging from approximately 0.5 to 1.0 µg/L) and one was above the threshold (approximately 3.4 µg/L).

For total copper, the Bight 2008 85th percentile threshold was 2.2 µg/L (threshold revised by Bight 2013 data to 1.9 µg/L). Of the three ASBS 24 post-storm samples assessed for total copper during Bight 2008, two had concentrations below the threshold (approximately 0.4 and 0.5 µg/L) and one was slightly above the threshold (approximately 2.3 µg/L).

For total nickel, the Bight 2008 85th percentile threshold was 1.5 µg/L (threshold revised by Bight 2013 data to 2.2 µg/L). For the three ASBS 24 post-storm samples assessed during Bight 2008, two had concentrations below the threshold (approximately 0.5 and 0.7 µg/L) and one was above the threshold (approximately 4.2 µg/L).

For total zinc, the Bight 2008 85th percentile threshold was 8.6 µg/L (threshold revised by Bight 2013 data to 19 µg/L). Of the five ASBS 24 post-storm samples assessed for total zinc during Bight 2008, three had concentrations below the threshold (ranging from 0 to approximately 2.1 µg/L) and two were above the threshold (approximately 10.5 and 11.0 µg/L).

Samples collected as part of the Bight 2008 efforts were not analyzed for mercury or selenium, and thus no Bight 85th percentile thresholds were established for these constituents.

4.2.2 Total Suspended Solids

For TSS, the Bight 2008 85th percentile threshold was 16.5 mg/L(threshold revised by Bight 2013 data to 55.4 µg/). Of the five ASBS 24 post-storm samples assessed for TSS during the Bight 2008, two had concentrations below the threshold (approximately 8.0 and 10.0 µg/L) and three were above the threshold (ranging from approximately 50 to 130 µg/L).

4.2.3 Total PAHs

For total PAHs, the Bight 2008 85th percentile threshold was 19.6 ng/L (threshold revised by Bight 2013 data to 12.5 ng/L). Of the four ASBS 24 post-storm samples assessed for total PAHs during the Bight 2008, all four samples had concentrations below the threshold (approximately 0, 5, 8, and 11 ng/L).

4.2.4 Organophoshorous Pesticides and Pyrethroids

Samples collected as part of the Bight 2008 efforts were not analyzed for organophoshouours pesticides or pyrethroids, and thus no Bight 85th percentile thresholds were established for these constituents.

5.0 POTENTIAL DISCHARGE SOURCES ASSESSMENT OF POLLUTANT LOAD REDUCTION TARGETS

An assessment of the potential pollutant load reductions targets was performed to determine the controls required to be implemented in order to enhance the water quality of the ASBS. The first step in the assessment process was to compare wet weather receiving water quality monitoring data with data for reference monitoring sites in accordance with the flowchart provided as Attachment 1 to the General Exception. This evaluation determined, per the Special Protections guidance, that an exceedance of natural water quality exists for three constituents (mercury, selenium, and total PAHs) at receiving water Site S02 and discussed in more detail in Section 4.0. Of the various constituents analyzed, these three constituents were the only identified as potential exceedances of the natural water and only slightly above the Bight 2013 85th percentile reference thresholds. At the presentation of Bight 2013 data, held on August 21, 2014, at the SCCWRP office, the presenting staff indicated that ASBS 24 currently has very good overall water quality. An assessment of the potential discharge locations was performed which includes a discussion of the drainage areas associated with the potential discharge locations.

5.1 Potential Discharge Source Assessment

The General Exception states that the ASBS Pollution Prevention Plan shall describe how the necessary pollutant reductions in storm water runoff will be achieved through Management Measures and associated Management Practices to achieve storm water runoff target levels on average during a design storm to below either the Table B) Instantaneous Maximum Water Quality Objectives (WQOs) in Chapter II of the Ocean Plan or a 90% reduction in pollutant loading during storm events for the applicant's total discharge. The Ocean Plan was updated subsequent to the General Exception adoption. The updated Ocean Plan now refers to Table B as Table 1 (formerly Table B), and this Plan utilized the updated table title. For the constituents that are currently in exceedance of the natural water quality of the ASBS and that also have an associated Table 1 Instantaneous Maximum WQO value (mercury and selenium), this Draft ASBS Pollution Prevention Plan evaluated potential discharges locations.

The Ocean Plan Table 1 Instantaneous Maximum WQO for mercury and selenium are 0.4 µg/L and 150 µg/L, respectively. The Ocean Plan Table 1 does not list an Instantaneous Maximum WQOs for PAHs. Chemistry data are not currently available for private residential drains or sheet flow originating from beach parking lots and roads. The General Exception does not require monitoring to be performed on potential discharge sources. Limited data are currently available for mercury and selenium EMC values for specific land uses. Common major sources of mercury include scrap metal piles, deteriorating metal and paint, and airborne emissions from burning coal, oil or municipal waste (UWE, 1997). Selenium is a naturally occurring element that persists in soils and aquatic sediments and may be leached from sediments as a result of modifications in the natural hydrologic regime (LARWQCB, 2002).

5.1.1 Assessment of County Potential Discharge Sources

The majority of the County potential discharge sources are associated with beach parking lots. Street sweeping machines are used at County beach parking lots daily during the work week (i.e., performed five times a week). County beaches are classified as open space/recreation land use.
In the case of Zuma County Beach, the discharge of parking lot sheet flow is directed into beach sand approximately 200 ft., on average, from the ocean water. Similarly, at Nicholas Canyon County Beach, the areas where sheet flows are directly along the access road (use by County staff only) and the small drain that conveys flows from the parking lot end in sandy areas above the ocean water approximately 15 ft. Given that the speeds within the County beach parking lots are low, vehicle traffic is much less than typical roadways, machines frequently sweep the parking lots, and the general location of the discharges (beach sand), the nonpoint sources associated with County beach parking lots are not considered to be contributing to the current exceedance of natural water quality in the ASBS.

Four identified potential discharge sources at Nicholas Canyon County Beach have an outfall of undetermined ownership and originate from residential lots located upland from the beach. These potential discharge sources terminate in the beach sand.

5.1.2 Assessment of Potential Discharge Sources Conclusions

Twenty-two of the potential sources are associated with the County Beach parking lots and roadways with five located at Nicholas Canyon County Beach and 17 at Zuma County Beach. Due to the source of runoff (from frequently swept beach parking lots) and based on the discharge locations (sandy beach), these identified County Beach parking lots and roadways potential discharge sources are not considered to be contributing to the current exceedance of natural water quality in the ASBS.

6.0 CONTROL MEASURES

6.1 Enhanced Nonstructural Programs

Existing nonstructural PIPPs, O&M programs, and enforcement programs will continue to be implemented and maintained indefinitely to ensure ongoing protection of ASBS 24 and to meet the requirements of the ASBS Special Protections. This section describes potential enhancements to existing nonstructural programs intended to further promote load reductions and further improve and protect ASBS water quality. The feasibility of these enhancements will be explored first, and if found viable, the proposed enhancement discuss here may be implemented. Proposed potential program enhancements are presented in Appendix C and include the following:

- Enhanced, collaborative, environmentally friendly, alternative services program(s).
- ASBS education signage (County).
- Architectural copper and metal building material mitigation program(s) (City).
- Metal building material ordinances (City).

6.1.1.1 Enhanced Collaborative Environmentally Friendly Alternative Services Program(s)

When implementing this type of program, the County and City will look for opportunities to enhance existing environmentally friendly alternative services and PIPPs currently provided by the Parties. This program will be implemented using the adaptive management process to optimize nonstructural program synergies and target the highest priority wet weather sources of priority pollutants. Types of existing PIPPs that may be enhanced include the Clean Bay Restaurant Certification Program, City of Malibu's Environmentally Preferable Purchases and Practices Policy (EPPP), Recycled Products Purchasing Policy (RCPP), Restaurant Certification Program, and Los Angeles County's Rethink LA Program. The LACoMAX (see Section 3.2.1.1) platform has been presented as an example of types of enhancements and synergies, which may be implemented depending on water quality needs and available funding.

Users have identified LACoMAX as “easy, fast, and rewarding” and a “great resource for L.A. County” to exchange goods. To reach a larger audience, this program could be cross-referenced with similar programs, such as the Malibu Green Room webpage, Craigslist-Los Angeles, and other regional websites. The platform currently provides six management regions for exchange, and the platform could be expanded to include ASBS- and TMDL-specific regions, along with educational information related to the benefits of the program and reduced impacts to the ASBS and receiving waters that may be caused by improper disposal of unwanted items. Partner webpages could provide links to other exchange programs and up-cycling venues (e.g., Goodwill, consignment, thrift stores, and swap meets). Additional enhancements to the platform may be identified by analyzing user data from the existing platform and/or requesting users to complete questionnaires.

6.1.1.2 ASBS Educational Signage

This program will involve the design and installation of educational placards along boardwalks and at parking lot entrances to the beaches. These placards, translated in both English and Spanish, will describe the unique resources of ASBS 24 and highlight features of interest specific

to each beach. Additional educational messages related to source controls and pollution prevention measures will be determined based on wet weather data and targeted sources. This program will provide a direct nonstructural intervention to potential pollutant sources at County beaches, as well as influence behavior for local beachgoers who live in residential areas that discharge to ASBS 24.

6.1.1.3 Architectural Copper and Metal Building Material Mitigation Program(s)

Metal building materials may appear to be a limited wet weather source, but in coastal areas buildings may be a year-round source of runoff and metals loading because the marine layer can create measurable runoff as water condenses on rooftops and buildings structures (City of San Diego, 2010b). Monitoring data of storm water wash-off from metal building materials has been shown to be associated with elevated copper and zinc levels (Golding, 2008).

This program will investigate the feasibility of offering rebates for architectural copper and zinc mitigation measures applied to metal building structures. Potential mitigation measures may include: application of sacrificial paint (e.g., copper and zinc oxidation protection paints), downspout diversions, rain barrels, and cisterns. The rebate program may be modeled after the Cash for Grass and other water conservation incentive programs discussed in Section 3.2.1.2. Education materials may be developed to promote existing materials, such as the Surfrider OFG materials and ASBS materials, in which Surfrider may agree to incorporate into the OFG program, and online media, such as the Malibu Green Room and Clean LA websites.

6.1.1.4 Metal Building Material Ordinances

As discussed in Section 6.1.1.3, buildings with metal architectural features may be a year-round source of runoff and metals loading. Metal building material ordinances, including the architectural copper ban and zinc alternative building material ordinance, are proposed as a potential programs enhancement and are a true source of control. It is generally recognized that implementation of any kind of metal building material ordinance will require significant education and outreach. Targeted audiences will include residents and businesses, and may also include architects and engineers who design and build infrastructures within the ASBS 24 drainage area. A program such as this would first need to go through a feasibility review and also receive City Council approval.

Architectural Copper Ban

This proposed City ordinance would prohibit use of architectural copper for all new developments and re-development projects for buildings and facilities located within the ASBS 24 watershed.

Zinc Alternative Building Material Ordinance

Galvanized zinc is frequently specified by agencies, including Caltrans, for outdoor installations due to material durability and lack of maintenance requirements. This City program would evaluate the feasibility of implementing a zinc building material policy that would eliminate, reduce, mitigate, or control the use of zinc building materials. Concurrent with the feasibility analysis, stakeholders would be engaged through public meetings. Based upon the findings of the feasibility analysis and stakeholder engagement process, a proposed zinc ordinance would be implemented. This program would recognize that galvanized zinc is frequently specified for outdoor installations due to material durability and lack of maintenance requirements.

6.2 Structural BMPs

The pollutant loading reduction assessment (Section 5.0) performed in preparation of this Plan indicated that structural BMPs are not required for potential discharge sources not regulated under the NPDES permit.

6.3 Pollutant Load Reduction Quantification For Nonstructural Controls

This section discusses how existing nonstructural programs have contributed to compliance with the zero dry weather discharge criteria of the Special Protections. The quantification of the effectiveness of nonstructural controls is a developing science. Although the effectiveness of most nonstructural controls is not well documented in available literature, data on recent studies (e.g., street sweeping and source studies) provide a basis for developing quantification estimates. It has also been recently documented (City of San Diego, 2010a; Brown et al., 2010; Pohl, 2010; Cac and Ogawa, 2010; Krieger et al., 2010) that nonstructural controls which target operational and true source controls can provide far more cost-effective, long-term solutions than end-of-pipe treatment BMPs.

Nonstructural BMPs are designed to reduce the concentrations of constituents at the source prior to the generation of polluted surface storm water runoff and therefore prior to runoff entering storm drains or the receiving water. Typical load reductions associated with the quantification of nonstructural programs is on the order of 25% (LARWQCB, 2005) (LACDPW, 2012b).

6.3.1 Load Reductions Associated with Nonstructural Solutions

The scope of the nonstructural program load reduction quantification is limited. Many nonstructural programs currently implemented within ASBS 24, such as the Parties' IC/ID and spill response programs, cannot be quantified and entered into a load reduction model because they are designed to control constituents at their source for a sporadic event. However, these programs do offer a water quality benefit, and various types of data are available and may be used to demonstrate changes in public behavior.

When targeted at the actual pollutant source, nonstructural solutions (e.g., operational source controls) have been shown in studies to be very effective at removing the source and therefore reducing concentrations/loads to below regulatory requirements. For example, the *Mission Bay Clean Beaches Initiative Bacterial Source Identification Study* found birds and over-irrigation to be two major sources of bacterial contamination (Weston, 2004). Monitoring conducted following a redesign of the irrigation system and relocation of an in-water raft popularly used by birds indicated that bacterial concentrations in the receiving waters were very low. During the study, there was one exceedance, and follow-up studies showed that the source of the exceedance was not associated with irrigation runoff or birds (Weston, 2006).

Furthermore, true source controls which replace or modify the constituent content of products that have been determined to impact water quality should be part of the nonstructural program. True source controls have been proven to be highly cost effective as in the case of the banning of

the pesticide Diazinon, which has resulted in a clear reduction from well above to now below the water quality objective in the Chollas Creek watershed in San Diego County, which is under a TMDL for this contaminant (SDRWQCB, 2007). The recently approved legislation which requires reduction of copper in brake pads in California was achieved through the Brake Pad Partnership. The legislation was based on scientific data showing the impact of copper from brake pads on water quality in urban areas. This true source control approach will significantly reduce copper concentrations in most urbanized watersheds. In the urbanized Chollas Creek watershed (which is under a dissolved metals TMDL), it has been estimated that approximately 90% of the copper loading is from brake pad deposition (City of San Diego, 2009). It is anticipated that most of the copper load reduction necessary to meet the Chollas Creek TMDL will be achieved from the reduction of copper in brake pads, a true source control strategy.

6.3.2 ASBS Focused Outreach, Water Conservation, and Irrigation Management Programs

Nationally, lawn care accounts for 32% of the total residential outdoor water use (USEPA, 2013) and over-irrigation is a common source of runoff. While irrigation runoff is a freshwater source and does not represent a pollutant unto itself, irrigation-related dry weather flows have the potential to erode landscaping and mobilize pollutants. Even when irrigation water does not reach the MS4, pollutant mobilization to impervious surfaces can create a potential discharge source of pollution during wet weather.

Use of water-saving devices (e.g., irrigation controllers, sprinkler heads) conserve water and prevent over-irrigation. The former LIEP and Water Saving Devices Rebates Programs educational literature provide an estimated water savings of 13,500 gallons per location converted per year. Use of drought-tolerant plants and alternative landscaping (e.g., rock garden) in place of grass provides additional water savings and further reduces the likelihood of over-irrigation. The water conservation and over-irrigation reduction programs, which the County and the City administer and provide educational support for in the ASBS 24 drainage area, have helped control over-irrigation runoff and achieve compliance with the zero dry weather discharge criteria of the Special Provisions. These programs have also helped reduce pollutant mobilization and creation of potential discharge sources on impervious surfaces. As participation in the rebate program grows, there is potential for an additional 1 to 2% wet weather pollutant load reduction through this indirect source control program.

As discussed in Section 3.2.1.3, OFGs and CA Friendly Landscapes are structural BMPs that infiltrate runoff and bio-remediate pollutants, effectively disconnecting both dry weather and the first flush of storm water runoff from the receiving water. The City has two landscapes that can be used as examples to the community: one at Legacy Park and one at Bluffs Park. The City recognizes three residential OFGs, one of which is located within ASBS 24 at Point Dume. Promotion of local OFGs contributes to their implementation by residents, educational institutions, and businesses. Ongoing implementation of this program and the resulting net increase in OFG and CA Friendly Landscape implementation will likely translate to an additional 1 to 2% wet weather pollutant load reduction.

The City (see Section 3.2.1.4) provides education and outreach on water-saving incentive programs and OFGs, and responds to irrigation-related IC/IDs. The City's new 24-hour Pollution Prevention Hotline received fewer than 10 calls in the first year of service, or on average less than one per month. Because the hotline is relatively new, it may take time for the community to

be familiar with the hotline, and therefore the hotline may see an increase in calls in the future. (The Clean LA hotline, which is shared with the District, fielded 34,064 calls during the fiscal year covered under the 2011-2012 Annual Report [LACDPW, 2012a].) Most of the IC/ID field investigations have been due to over-irrigation and were resolved within a month through collaboration between the CPS and the property owner. Additionally, as of September 5, 2014, the City has launched a new online water wasting report form in response to the historic drought conditions. This reporting form will make it more efficient for the community to notify and the City to respond to incidents of runoff due to over-irrigation among other water wasting activities. Ongoing implementation of the ASBS Focused Outreach Program will continue to increase participation in rebate programs and OFG and California Friendly Landscaping implementation, contributing to the wet weather load reductions previously discussed.

6.3.3 Metal Building Material Management Program

Recent studies have shown that architectural copper and galvanized steel building materials can elevate the metals concentrations measured in storm water runoff from 10 to 100 times greater than concentrations measured for non-metal building materials (City of San Diego, 2009; Chang et al., 2004; Davis et al., 2001). Zinc in storm water runoff measured directly from galvanized metal surfaces is typically very high, between 1,000 and 15,000 µg/L (Golding, 2008).

An aggressive outreach and incentive program may encourage targeted audiences to proactively modify infrastructure (e.g., install OFGs/California Friendly Landscapes and rain barrels to capture runoff, replace with non-metal materials, divert air conditioning condensate away from metal infrastructure) and other behaviors (e.g., proactive housekeeping, apply and maintain sacrificial coatings). In the ASBS, a phase-out and full ban of copper and zinc building materials represents a true source control measure that could significantly reduce metals loading to ASBS 24. In Palo Alto, CA, a similar metal building material ordinance for copper plumbing fixtures was implemented in response to a copper TMDL (City of Palo Alto, 2011). Institutional controls and regulatory change also represent an important step toward laying the foundation for inspections, if determined to be appropriate.

A Simple Method model was prepared to estimate the load reductions from implementing this program. To complete the model, several assumptions related to a typical watershed were made and include the following:

- An urban watershed composed of 50% residential, 40% open space, and 10% transportation.
- Of runoff from these land uses, 25% have elevated concentrations of copper resulting from building materials (e.g., copper rain gutters).
- Incentive program would be utilized by 20% of the residential land use area.
- Where the incentive program is utilized, copper concentration reductions in storm water would be in the range of 40% to 80%.

Based on these assumptions, metal building material management programs could result in a 6% to 12% pollutant load reduction. For more information on the load reduction calculations, see Appendix D.

7.0 ASSESSMENT OF ANTHROPOGENIC SEDIMENTATION POTENTIAL

In accordance with the requirements of the General Exception, the natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation (SWRCB, 2012a). An assessment of the potential areas prone to anthropogenic sedimentation was performed as part of this Pollution Prevention Plan for the purpose of identifying areas where sediment control BMPs may be required. The general assessment process included first performing a desktop analysis of geological conditions, topography, land use, and aerial imagery for the applicable area. Next, a reconnaissance of the area was performed to verify desktop findings and further analyze the drainage areas. Finally, the desktop and reconnaissance data collected were then complied into this Plan, which details the assessment methodologies, results, and conclusions.

7.1 Sedimentation Definitions

Basic definitions relating to sedimentation and the coverage/applicability of the sedimentation identification assessment are provided in this section. These terms are relevant to the entire document. Additional terms, applicable to specific subsections, are defined within the applicable subsection, as needed.

Erosion
"The process by which soil particles are detached and transported by the actions of wind, water, or gravity." (SWRCB, 2010).

Sediment
"Solid particulate matter, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water, gravity, or ice and has come to rest on the earth's surface either above or below sea level." (SWRCB, 2010).

Sedimentation
"Process of deposition of suspended matter carried by water, wastewater, or other liquids, by gravity. It is usually accomplished by reducing by reducing the velocity of the liquid below the point at which it can transport the suspended material." (SWRCB, 2010).

Anthropogenic Sedimentation
For the purposes of this assessment, anthropogenic sedimentation is defined as sedimentation resulting from past or present mankind activities. Stated differently, anthropogenic sedimentation is any sedimentation that would not be present in nature in the absence of mankind and man-made improvements (i.e., past and present absence of mankind).

Pollution Prevention Plan Assessment Area
In accordance with the General Exception, the Pollution Prevention Plan focuses on the assessment of potential discharge source locations, including pollutants, and the potential controls to reduce pollutant loading from these potential discharge source locations. Therefore, the Pollution Prevent Plan assessment of areas prone to anthropogenic sedimentation was limited to the tributary drainage areas associated with potential discharge source locations detailed in

Section 2.5 of the Pollution Prevention Plan. Figure 7-1 shows the potential discharge source locations identified in Section 2.5. In general, these locations have drainage areas located adjacent to the shoreline that are not serviced by a storm drain conveyance covered under the NPDES permit.

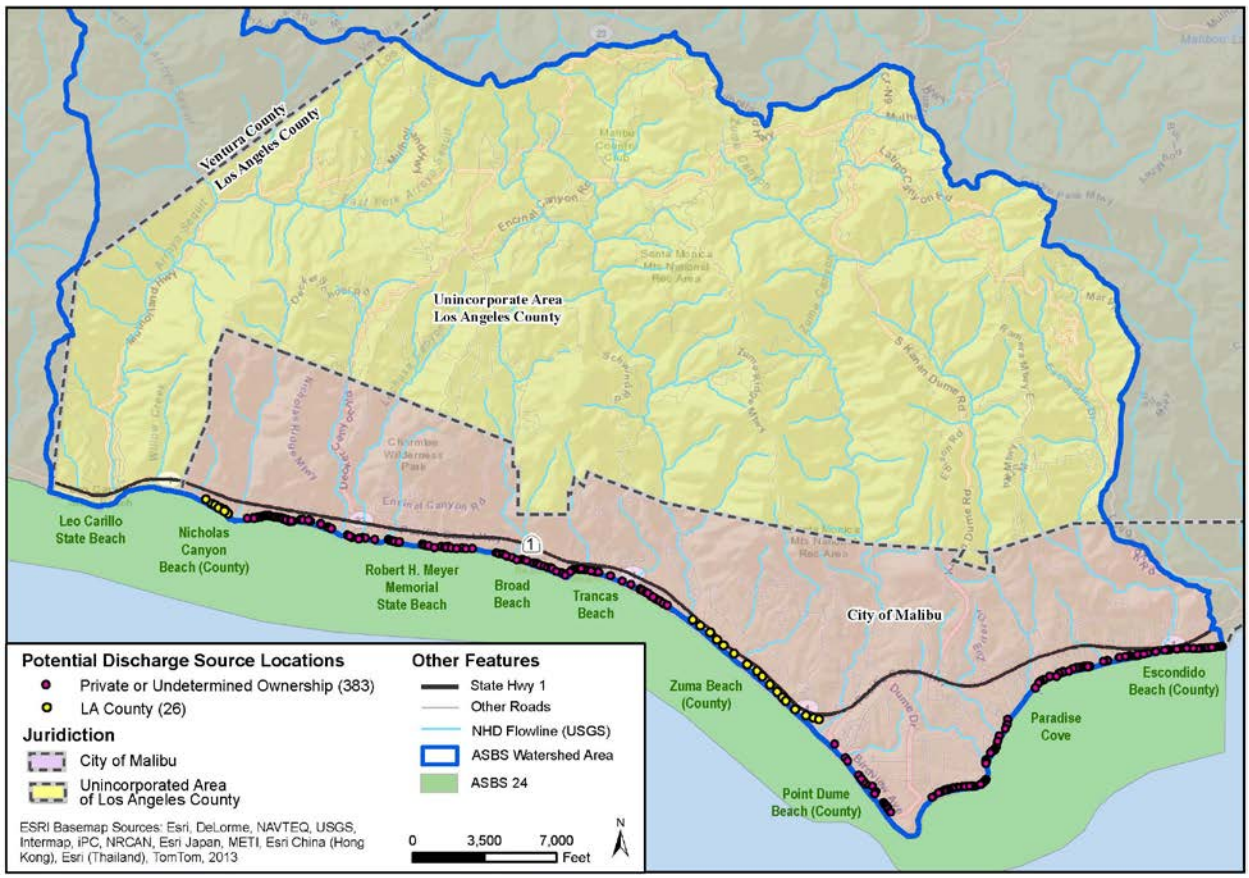

Figure 7-1. ASBS 24 Identified Potential Discharge Source Locations

7.2 Desktop Analysis

A desktop analysis was performed evaluating the geology, topography, land use, and general surface condition (e.g., vegetation cover) to identify potential areas prone to erosion within the tributary drainage areas to the Parties' potential discharge source locations. The collection of area geological data included conducting literature reviews of various references applicable to the region. County of Los Angeles Department of Transportation staff were interviewed regarding roadway maintenance activities and the frequency of sediment removal performed in the area. Sediment risk data for the area, obtained from the General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Actives (Construction General Permit) (SWRCB, 2010), were evaluated to determine the general sediment risk in the area for disturbed areas. Geographic Information System (GIS) data relating to topography, land use, and aerial imagery were analyzed to evaluate surface gradients and coverage types in the area.

7.2.1 ASBS 24 Assessment Area Geology

As detailed in Section 2.6, the Pollution Prevention Plan identified 409 potential discharge source locations along the ASBS 24 coast within the Parties' jurisdiction. The drainage area for the northerly most potential sources, located near Nicholas Canyon State Beach, consists primarily of Santa Monica Mountain (Topanga Formations) with Trancas Formation along the shoreline. The assessment areas along the west half of Broad Beach consist primarily of the Santa Monica Mountains (Topanga, Santa Susana/Coal Canyon, and Llajas Formations) with small areas of Trancas Formation along the coastline. The areas along the eastern half of Broad Beach and the northeastern half of Zuma Beach have drainage areas that consist of varying percentages of Modelo Formation along the coast and Santa Monica Mountains (Topanga, Santa Susana/Coal Canyon, and Llajas Formations; Conejo Volcanics; and Diabase Intrusions). The assessment areas located along the southeastern half of Zuma Beach, Point Dume Beach (Westward Beach), and the assessment areas located between Point Dume and Escondido Creek have drainage areas within the Monterey/Modelo Formation. The assessment areas located along Escondido Beach consist of the Santa Monica Mountains with small areas of Modelo Formation along the coast. Figure 7-2 through Figure 7-4 show the geological features and drainage areas of the Parties' potential discharge source locations identified in this Plan (NPS, 2007).

Map symbols used along the coastal area were defined using National Geologic Map Database. Pleistocene marine terrace deposits along the shoreline include the Trancas and Monterey Formations. The symbols used to depict general costal geologic features on Figure 7-2 through Figure 7-4 included the following:

- Qa – Alluvial gravel, sand, and clay of flood plains.
- Qaf – Artificial cut and fill.
- Qao – Older dissected alluvial gravel, sand and clay; on coastal area deposited in part on a wave-cut platform, forms several terraces.
- Qg – Gravel and sand of major stream channels.
- Qls – Landslide debris.
- Qos – Old dune sand at Point Dume.
- Qs – Beach Sand.
- Tr – Trancas Formation composed of marine sandstone, mudstone, silty shale, and claystone.
- Tmt – Modelo/Monterey Formation composed of marine clay shale and laminated to platy siltstone with sandstone.

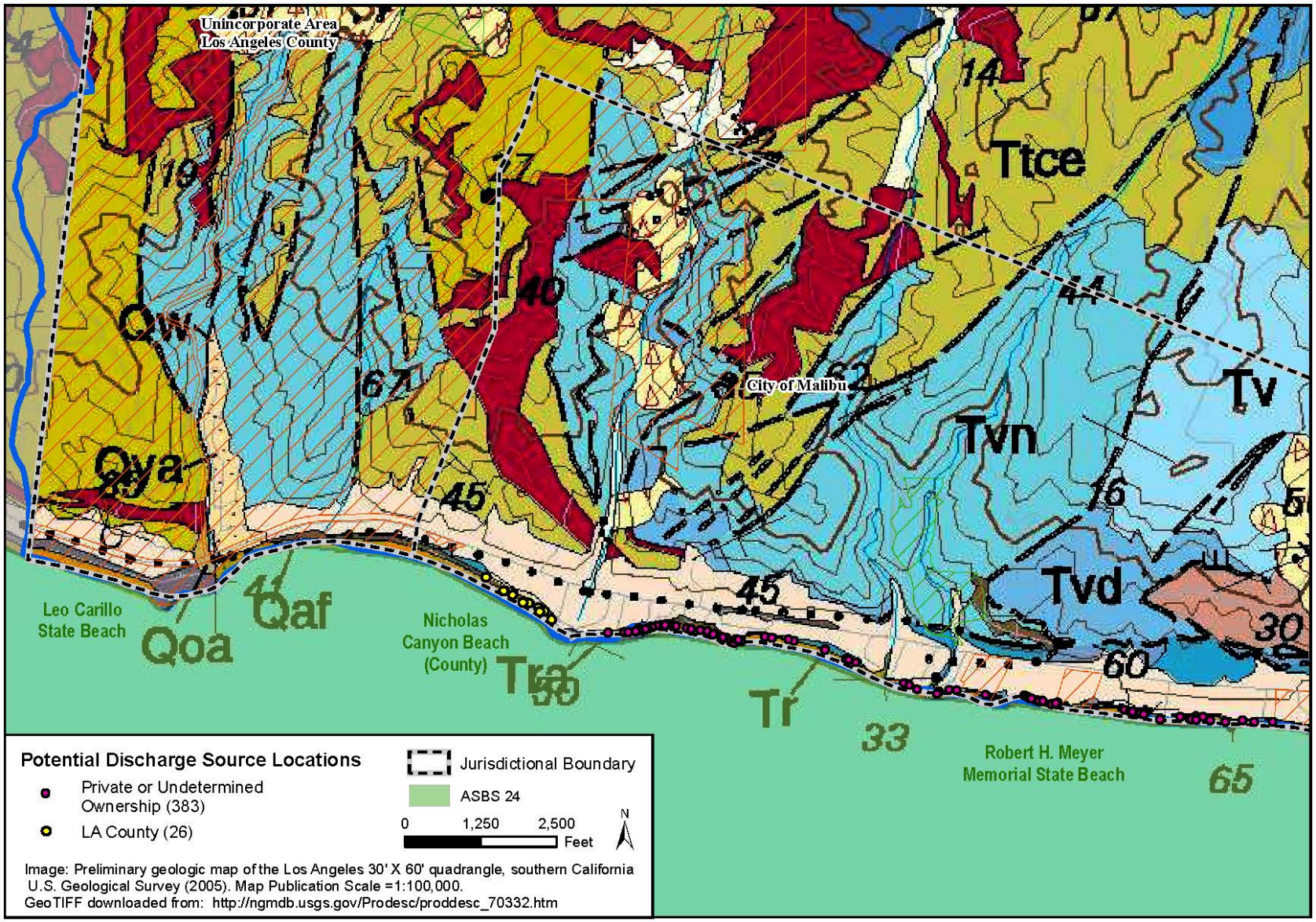

Figure 7-2. Geology of Assessment Areas: Nicholas Canyon Beach, El Pescador Beach, and La Piedra Beach

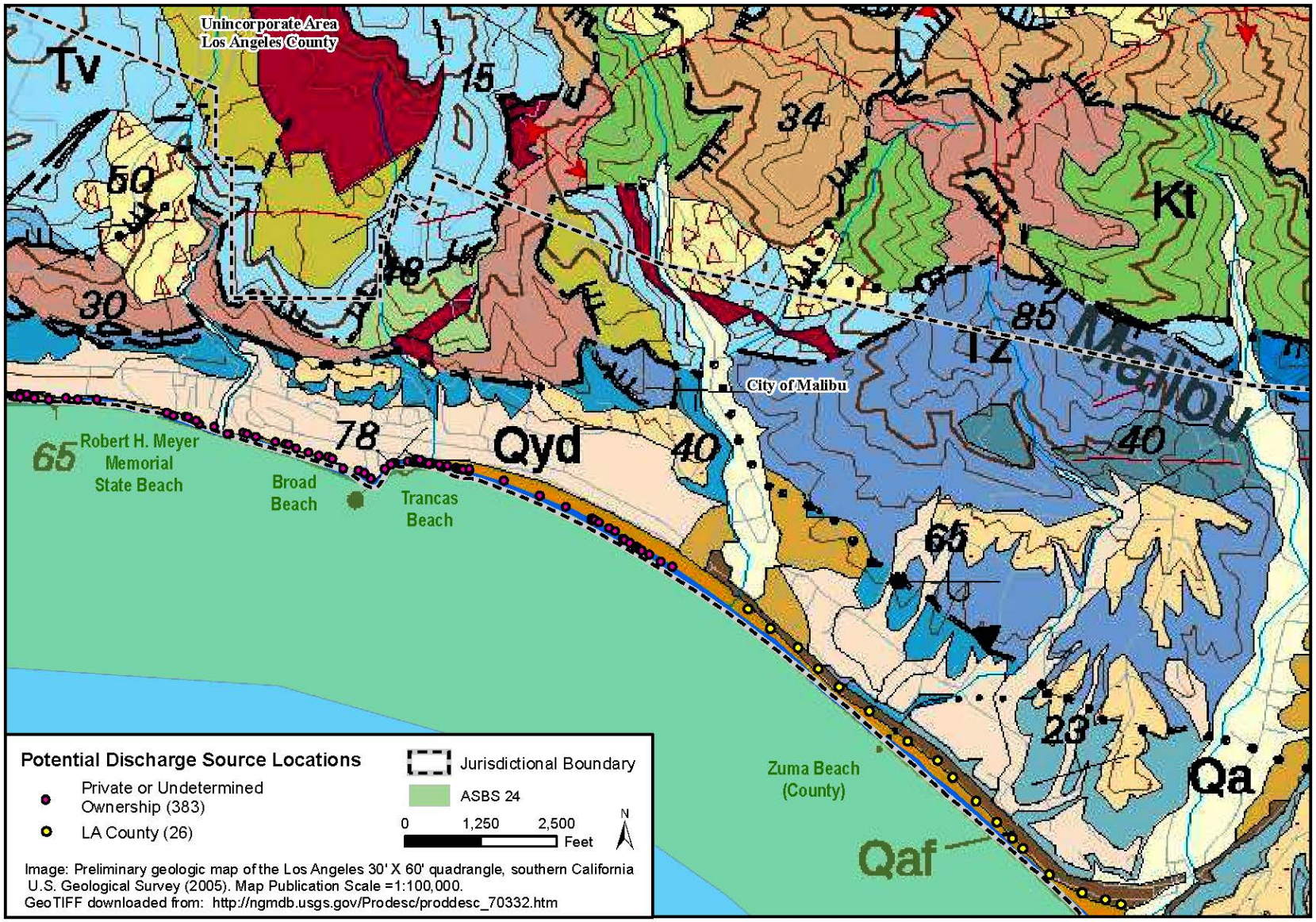

Figure 7-3. Geology of Assessment Areas: El Matador Beach, Broad Beach, and Zuma Beach

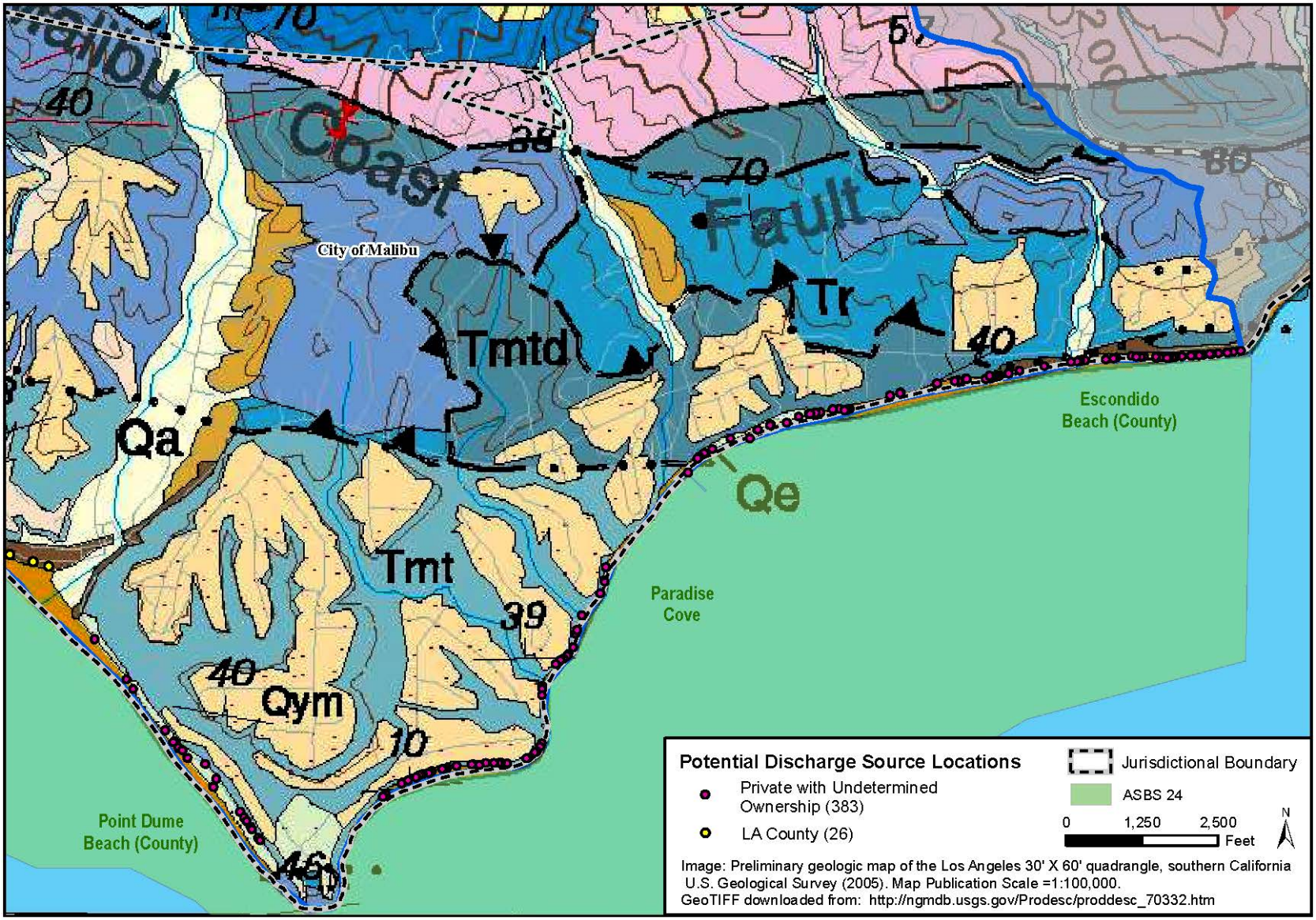

Figure 7-4. Geology of Assessment Areas: Point Dume Beach to Escondido Beach

7.2.2 Assessment Area Land Use

Along the coast at the northern-most point of the Parties' jurisdiction, the location of the County jurisdictional boundary coincides with a natural high point in the topography, and thus, the drainage area boundary follows the County jurisdiction boundary fairly well for a couple of miles inland. The shoreline assessment areas immediately south of the County jurisdictional boundary include vacant/undeveloped land use that is generally occupied by Leo Carillo State Beach. The City jurisdiction boundary is located south of Leo Carillo State Beach, approximately 1.25 miles south of the County jurisdiction boundary. The City's jurisdiction extends south along the coast past the south-eastern limits of ASBS 24. The assessment areas along the coast within the City's jurisdiction include primarily residential land use types with some parks and recreation/beach park and open space and recreation land use types. Figure 2-1 shows the land use designations within the Parties' jurisdiction.

Aerial and other photographic imagery data were reviewed using Google Earth® software and ESRI GIS imagery sources to determine the types of land cover within the Parties' potential discharge source location drainage areas. The review showed that areas occupied by residential lots along the coast within the assessment area typically consisted single-family dwellings, each surrounded by large areas of well-maintained landscaping that included grass, shrubs and brushes, and trees. The Google Earth® Street View tool imageries were reviewed and showed the residential lots as having well-maintained vegetated areas with very little non-vegetated (bare) areas.

7.2.3 General Sedimentation Risk Assessment

To estimate the general sediment risk for the areas that drain to the Parties' potential discharge source locations, a sediment risk was determined for a hypothetical site based on the procedures detailed in the *NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities* (Construction General Permit). The intent of this assessment is to determine the potential sediment runoff for areas where minor improvements (e.g., landscaping) or other circumstances may result in bare soil that would not be considered construction activity. The assessment completed as part of this plan is not performed for the purpose of assessing construction activities, which are permitted and inspected through applicable County and City programs, and which require that risks be determined and mitigated through the proper implementation of BMPs.

7.2.3.1 Sedimentation Risk Assessment Methodology

The risk determination procedure detailed in the Construction General Permit includes determining both the "project sediment risk" and the "receiving water risk." The two risks are then used in combination to determine the overall project risk. However, for this plan (assessing potential sedimentation), only the sediment risk was evaluated.

The Construction General Permit describes two options for determining sediment risk: (1) the GIS Map Method – EPA Rainfall Erosivity Calculator and GIS map; and (2) the Individual Method – EPA Rainfall Erosivity Calculator and individual data. Both of these methods include using available EPA resources to estimate a rainfall-runoff erosivity factor. Depending on the

method selected, the soil erodibility, project length, and slope parameters are estimated either from a map (Method 1) or from site-specific data applied to an erodibility factor nomograph and length-slope factor table (Method 2). For both methods, the data are applied to the Universal Soil Loss Equation (USLE) to estimate a sediment load for the applicable period (SWRCB, 2010). The USLE is detailed as follows:

$$A = R*K*LS*C*P$$

Where:

- A = the computed soil loss (sheet and rill erosion) (tons/acre).
- R = the rainfall erosive factor for the given period.
- L = the slope length factor.
- S = the slope gradient factor.
- C = cover factor (1.0 for bare ground conditions).
- P = management operations & support practice (1.0 for bare ground conditions).

Based on the computed soil loss (sediment load), the site is classified as having either a low-, medium-, or high-sediment risk (SWRCB, 2010). Table 7-1 summarizes the risk levels associated with the various soil loss quantities.

Table 7-1. Sediment Risk Levels

Soil Loss	Risk Level
<15 tons/acre	Low
15-75 tons/acre	Medium
>75 tons/acre	High

Source: SWRCB, 2010.

7.2.3.2 Sedimentation Assessment Calculations

To assess the general sediment risk for the area, a hypothetical site was evaluated using the methods described in the Construction General Permit. The time period was estimated to be a 2-month duration, from December 1st through January 31st.

The rainfall erositvity factor, or R factor, is calculated as a product of the Erosivity Index (EI) percentage and the average annual R value. These two parameters were obtained from the *Storm Water Phase II Final Rule Construction Rainfall Erosivity Wavier*. The R factors are used as surrogate measures of the impact that rainfall has on erosion and have been mapped using isoerodent contours (USEPA, 2012). The R values are based on the data analyses which indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I). The numerical value of R is the average annual sum of EI for storm events during a rainfall record of at least 22 years, and the isoerodent maps were developed based on R values calculated for more than 1,000 locations in the western United States (SWRCB, 2010). The average annual R value, based on the referenced isoerodent contour maps for the area, was estimated to be between the values of 60 and 80 ft. (80 ft. selected).

Next, it was determined that the area is within EI distribution zone 25. Based on this zone, the percentages of the EI distributions throughout the year were determined and are summarized on Table 7-2.

Table 7-2. Erosivity Index, Annual Distribution for Zone 25

Month	Jan	Jan	Jan	Feb	Mar	Mar	Mar	Apr	Apr	May	May	Jun	Jun
Day	1	16	31	15	1	16	31	15	30	15	30	14	29
EI (%)	0	9.8	20.8	30.2	37.6	45.8	50.6	54.4	56.0	56.8	57.1	57.11	57.2
Month	Jul	Jul	Aug	Aug	Sept	Sept	Oct	Oct	Nov	Nov	Dec	Dec	
Day	14	29	13	28	12	27	12	27	11	26	11	31	
EI (%)	57.6	58.5	59.8	62.2	65.3	67.5	68.2	69.4	74.8	86.6	93	100	

Source: USEPA, 2012.

The final R factor calculation is summarized on Table 7-3.

Table 7-3. R Factor Calculation Summary

Parameter	**Value**
EI % (Oct. 1-Dec. 31)	11.7%
EI % (Jan. 1-Mar. 30)	20.8%
Total EI %	32.5%
Average Annual R Factor	80 (100*ft.*tonf*in)*(ac*h*yr)$^{-1}$
Computed R Factor	**26.0 (100*ft.*tonf*in)*(ac*h*yr)$^{-1}$**

7.2.3.3 GIS Map Method for KLS Factor

The Construction General Permit details the use of the USEPA Monitoring & Assessment Program (USEPA EMAP) map in order to assist with determining the combined K, L, and S parameters for use in the USLE equation.

The soil erodibility factor K represents the susceptibility of soil or surface material to erosion, transportability of the sediment, and the amount and rate of runoff given a particular rainfall input (or lack of absorption and infiltration), as measured under a standard condition. Fine-textured soils that are high in clay have low K values (approximately 0.05 to 0.15), because the particles are resistant to detachment. Coarse-textured sandy soils also have low K values (approximately 0.05 to 0.2) because of high infiltration resulting in low runoff. Medium-textured soils (e.g., silt loam) have moderate K values (approximately 0.25 to 0.45) because they are moderately susceptible to particle detachment and produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and be as large as 0.65 (SWRCB, 2010).

The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a slope length factor, L, and the slope gradient factor, S. Typically, as slope length and/or slope gradient increase, soil loss increases.

Figure 7-5 shows the USEPA EMAP map. Based on this map, a KLS value of 1.6 was selected for the ASBS 24 drainage area.

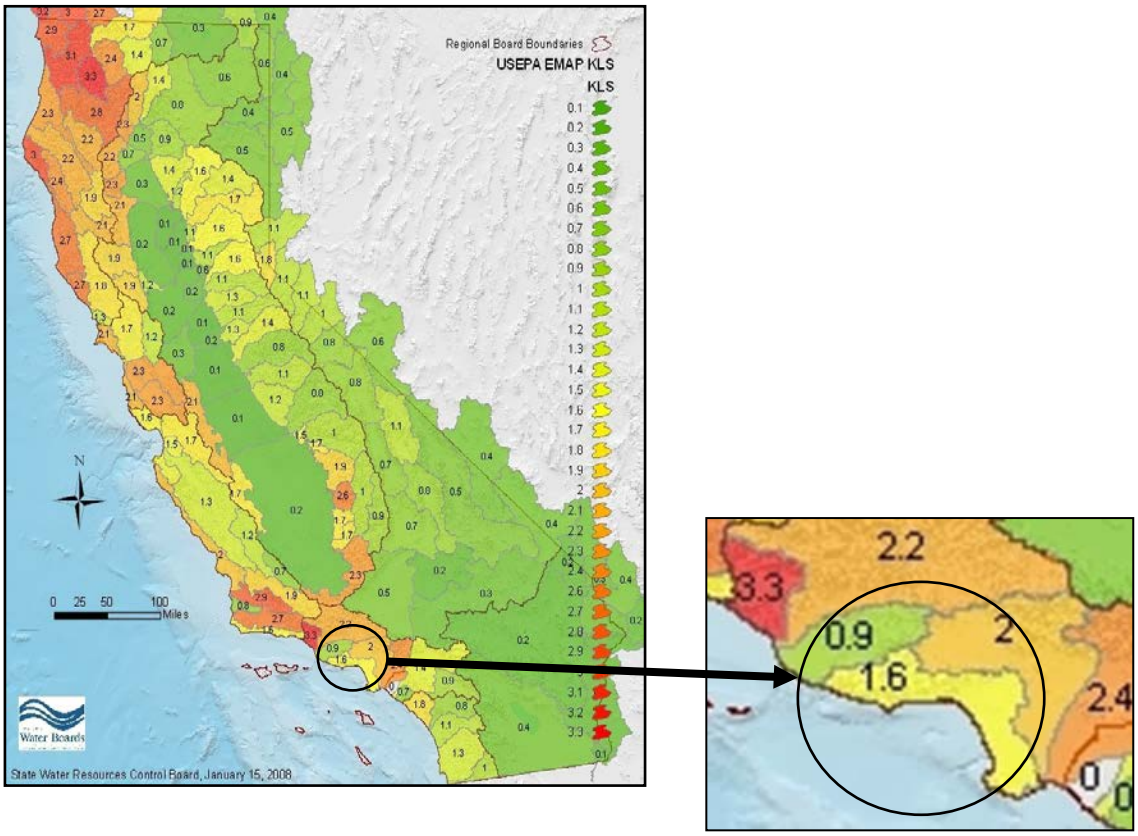

Figure 7-5. USEPA EMAP (SWRCB 2010)

The soil loss was calculated based on the assumptions made and values determined in this assessment. The soil loss for the hypothetical site was calculated to be 41.6 tons per acre. Based on the Construction General Permit sediment risk matrix (summarized on Table 7-1) and this value, disturbed areas (e.g., bare soil) draining to the ASBS would have, in general, a medium-level sediment risk.

7.2.3.4 Individual Method for KLS Factor

The Construction General Permit allows for site-specific data to be used in determining the KLS factor for the USLE equation. This includes performing soil analysis to determine the soil grain size distribution, site length, and average slope. This method was performed with the assumption that the soils consist of 60% sandy, 20% silty, and 20% clayey materials, which is reasonable for mountain formations and coastal bluffs. Based on an area of 0.25 acres (square), a length of 100 ft. was estimated. Based on the topography in the developed areas with slopes of approximately 2 to 10%, the higher end of the range was selected (10% slope).

Using the Soil Erodibility Factor Nomograph provided in the Construction General Permit, the K factor for the assumed soil composition was determined to be 0.19. Based on the LS Factors Table provided in the Construction General Permit and the stated assumptions, the LS factor was determined to be 1.46. Combining these parameters, it was determined that KLS is 0.277, and the soil loss would be 7.2 tons per acre. Based on the Construction General Permit sediment risk

matrix (summarized on Table 7-1), this value is considered a low-sediment risk for the applicable disturbed area.

7.2.4 Sediment Risk Assessment Summary

The assessment of the general sediment risk for disturbed areas within the ASBS 24 drainage area indicates that an area of disturbed soils without controls during the two relatively high rainfall months (December and January) during average conditions would have a potential sediment load of 7.2 tons per acre (per Method 2, individual site data calculations) or 41.6 tons per acre (per Method 1, GIS map data calculations). Smaller areas would have proportionally lower potential yields, as would disturbed areas with controls and/or disturbed areas that do not have a direct connection to the storm drain inlets (e.g., small area of disturbance above turf vegetation). Based on guidance found in the Construction General Permit, this equates to a low (Method 1) to medium (Method 2) sediment risk.

The difference between methods is based solely on the method used to calculate the KLS factor. The GIS map shows a large area with the same value, including the Santa Monica Mountains. If you include the steep mountain terrain in the weighted average (by area), the slope calculation for the GIS map appears to have overestimated the KLS for the areas along the ASBS coast where developed areas are located. In addition, the GIS map may overestimate the project slope length factor and slope gradient factor (LS factor). As such, Method 2, the site-specific data method, seems much more accurate for the applicable area.

This assessment provides a general estimate of the sediment yield potential for disturbed (or bare) soil cover for the stated assumptions. The results of this assessment were used to aid in the evaluation of the drainage areas during field reconnaissance. Considering the soil loss calculations, the R factor is fixed for the area and the K factor may change slightly in the different geology across the drainage areas. However, the slope length (L) and slope gradient (S) vary greatly when areas with the potential to be prone to sedimentation are evaluated. The field reconnaissance was performed with a focus on the implications that the length and slope parameters have on the potential soil loss for areas of bare soil or spare vegetation. Table 7-4 provides annual soil loss calculations performed for various typical sloped small areas with bare soil or sparse vegetation cover throughout the year.

Table 7-4. Annual Soil Loss Calculations for Sloped Areas

Slope Length (ft.)	Slope Height (ft.)	Slope Gradient (%)	Width (ft.)	Area (acres)	KLS Factor	Annual Soil Loss (tons/year)
10	0.2	2	100	0.023	0.025	**0.05**
20	0.4	2	100	0.046	0.029	**0.10**
30	0.6	2	100	0.069	0.032	**0.18**
40	0.8	2	100	0.092	0.036	**0.27**
50	1	2	100	0.115	0.040	**0.37**
10	1	10	100	0.023	0.072	**0.13**
20	2	10	100	0.046	0.093	**0.34**
30	3	10	100	0.069	0.122	**0.67**
40	4	10	100	0.092	0.146	**1.1**
50	5	10	100	0.115	0.173	**1.6**
10	2.5	25	100	0.023	0.160	**0.3**
20	5	25	100	0.046	0.247	**0.9**
30	7.5	25	100	0.069	0.338	**1.9**
40	10	25	100	0.092	0.424	**3.1**
50	12.5	25	100	0.115	0.507	**4.7**
10	5	50	100	0.023	0.268	**0.5**
20	10	50	100	0.046	0.458	**1.7**
30	15	50	100	0.069	0.638	**3.5**
40	20	50	100	0.092	0.809	**5.9**
50	25	50	100	0.115	0.980	**9.0**

R = 80 (100*ft.*tonf*in)*(ac*h*yr)$^{-1}$
K = 0.19.

Relative to the 50% (2:1 [horizontal: vertical]) gradient slope, the 2% slope gradient is estimated to lose only 4% as much soil for a 50-ft. slope length, and the 10% slope gradient is estimated to lose approximately 18% as much. This relationship is non-linear, and as the slope gradient increases, the potential soil loss significantly increases. Similarly, as the slope length increases, the potential soil loss significantly increases. The 50-ft. slope length calculation for the 2% slope gradient is estimated to have approximately seven times the soil loss of the 10-ft. slope length for the same gradient. The 50-ft. slope length calculation for the 50% slope gradient is estimated to have approximately 1,400% the soil loss of the 10-ft. slope length for the same gradient. These typical calculations indicate that in areas where disturbance has created unnatural sloped areas, the potential for soil loss exponentially increases as the slope gradient and/or the slope length increase.

7.3 Sediment Assessment Field Reconnaissance

A field reconnaissance was conducted to confirm the desktop analysis to evaluate the ASBS 24 drainage areas to potential discharge source locations prone to erosion and sedimentation. Areas draining to these locations that have a potential to discharge to ASBS 24 were observed for the indications of potential anthropogenic sedimentation. The field reconnaissance included driving the length of ASBS 24 as well as performing reconnaissance on foot where access is infeasible in order to perform a thorough evaluation.

In general, the areas of developed land use evaluated were observed to be residences with associated hardscape (e.g., driveways, walkways) and well-maintained landscaping. Some areas

were observed to have partially exposed (spare vegetation) natural bluff materials. Vegetation within the bluff areas consisted of a mixture of native scrubs and non-native species (e.g., ice plant). However, signs of erosion (e.g., rills, sloughing) were not observed on these exposed bluff materials, indicating that bluff material consisted of dense siltstone and/or sandstone formations consistent with a desktop geology evaluation performed as part of this plan. The field reconnaissance is presented, starting near the northerly extents of the Parties' jurisdiction at Nicholas Canyon County Beach, moving south, and finishing at the southeast limits of ASBS 24 and the Escondido Beach area.

The photograph depicted in Figure 7-6 was taken looking north at the access road and slopes located at Nicholas Canyon County Beach. The slopes have a good cover of vegetation. Signs of erosion were not observed in the area. North of the bluff areas were public facilities; natural bluffs extend up to Pacific Coast Highway (PCH). The PCH is not a part of this assessment. The natural bluffs located between the PCH and the beach appeared to not have received directed or sheet flows from the PCH, and the bluffs were not observed to be sources of anthropogenic sedimentation.

Figure 7-6. Nicholas Canyon County Beach Access Road and Slopes

An asphalt paved access path aligned parallel with the shoreline at Nicholas Canyon Beach was observed with some minor slope failures and slope sloughing. The failures did not appear to be caused by or associated with potential discharge source locations. Good vegetative cover was observed between the degraded slope and the beach sand along the ocean, and this degraded pathway was considered to be source of anthropogenic sedimentation.

Figure 7-7 was taken east of the PCH, looking down at the residential lots located above El Pescador State Beach. The lots were observed to consist of structures, associated hardscapes, and well-maintained landscaping. The photograph depicted in Figure 7-8 was taken looking north at the north extents of El Pescador State Beach. The area shown is the down-gradient side of the residential lots shown Figure 7-7. The bluffs were observed to either have good vegetative cover

or be near-vertical, composed of dense marine sandstone or similar materials (Trancas Formation).

Figure 7-7. Residential Lots North of El Pescador State Beach

Figure 7-8. Bluff Face at El Pescador State Beach

Figure 7-9 shows some of the residential lots located about La Piedra State Beach. The lots were observed to have typical improvements with well-maintained landscape cover. Figure 7-10 shows a couple of potential discharge source locations associated with residential properties

located above the bluff. The bluffs were observed to have good vegetative cover without rills or other signs of erosion.

Figure 7-9. Residential Lots North of La Piedra State Beach

Figure 7-10. Bluff at La Piedra State Beach

The photograph depicted in Figure 7-11 shows various residential lots along the Trancas Beach area. The topography allows for the homes to be located slightly up-gradient from the ocean. The properties have rock revetment or other means of protection along the ocean frontage. In general, the properties in this area are occupied by large structures, associated hardscape, and well-maintained landscape. Broad Beach is located slightly to the north and has similar topography and cover. Due to the location of these properties (behind a rock wall or similar structure),

topography (slight gradient), and cover (maintained landscape), the potential discharge source locations in this area were not observed to be sources of anthropogenic sedimentation.

Figure 7-11. Residential Properties Along Trancas Beach

Zuma County Beach is located south of Trancas Beach and consists of several large parking lots and typical beach facilities, such as restrooms, snack bars, and lifeguard structures. Above the wide sandy beach area, the property is primarily hardscape (asphalt) with minimal grades that direct sheet flows towards collection points and onto the beach sand. Figure 7-12 shows typical parking at Zuma County Beach. Based on the lack of opportunity for erosion to occur at this property (no bare sloped areas) and the potential discharge source locations (beach sand with large separation from the ocean water), the Zuma County Beach potential discharge source locations were not considered to be sources of anthropogenic sedimentation.

Figure 7-12. Parking Lot At Zuma County Beach (Typical)

Westward Beach and the Point Dume areas are located south of Zuma County Beach. The parking lot at Westward Beach is configured similarly to the lot at Zuma County Beach; however, the area east of the beach consists of steep bluffs followed by residential lots. A number of private or undetermined ownership drains are routed down the bluffs. The residential lots are similar to those previously described, with homes, hardscape, and maintained landscaping. Bluffs located east of the Westward Beach, typical of the Point Dume area, are shown in Figure 7-13 and Figure 7-14. The bluffs appeared to be Miocene age Modelo Formation, naturally formed into mild to very steep slopes with vertical walls in some areas. The bluffs were observed to either have good vegetative cover in the area of mild slopes or be near-vertical, composed of dense marine sandstone or similar materials.

Figure 7-13. Bluffs Located Near Point Dume

Figure 7-14. Bluffs Located Near Point Dume

The Dume Cove and Little Dume areas are located east of Point Dume, and the shoreline in these areas consists of bluffs with residential lots located above the shoreline on the mesas. Various small private drain piping was observed, located along bluffs and routed down the bluffs. Most of the private drains appear to be installed in order to convey storm water runoff from properties located on the bluffs to prevent sheet flow that would cause erosion to the bluff. By conveying all property drainage to one source through a pipe that discharges at the bottom of the bluff, the erosion potential is reduced. Similar to other areas included in this assessment, the residential

lots were observed with maintained landscaping and the natural bluffs were not observed to have runoff from potential discharge source locations directed towards them (i.e., signs of rapid/unnatural erosion were not observed in the assessment area). Figure 7-15 shows the overall Dume Cove Area, and Figure 7-16 shows private drains, which are typical in the area. Similarly, Figure 7-17 shows the Little Dume area, and Figure 7-18 shows private drains that are typical in the area.

Figure 7-15. Point Dume Area

Figure 7-16. Private Drains Located in Point Dume (Typical)

Figure 7-17. Little Dume Area

Figure 7-18. Private Drain in Little Dume Area (Typical)

The Paradise Cove area is located east of the Little Dume Area. This private beach consists of parking lots, a club facility, and a small pier. The parking lots are located adjacent to the beach sand. The up-gradient slopes along the parking lots were observed with good vegetation cover and without signs of erosion. Due to the low potential for erosion in the area because of good vegetative cover, the conveyance route (sheet flow across the asphalt parking lots), and flow termination location (beach sand), potential anthropogenic sedimentation sources were not identified in the Paradise Cove area. A typical parking lot and sloped area at Paradise Cove is shown in Figure 7-19.

Figure 7-19. Parking Lot and Sloped Area at Paradise Cove

East of Paradise Cove until approximately Escondido Creek, the area consists of residential lots. The topography is slightly different, with a larger beach area and milder slopes. The majority of improvements have been constructed above the mild slopes; however, a few homes, cottages, and cabanas are located at the base of the slope, just up-gradient from the ocean. Several access paths have also been constructed up the sloped areas. The sloped areas were observed with good vegetative cover, and signs of erosion were not observed in this portion of the assessment area. Figure 7-20 shows an access way and the mild sloped area, typical of the area.

Figure 7-20. Mild Slope East of Paradise Cove

The photographs depicted in Figure 7-21 and Figure 7-22 show the residential properties along Escondido Beach. The properties along the shoreline included in this assessment have structures constructed in close proximity to one another with little room for landscape. The shoreline that was observed to be unoccupied by structures was observed to be composed of rock revetment. Due to the lack of exposed soils and therefore the lack of erosion potential, the potential discharge source locations in this area were not considered to be sources of anthropogenic sedimentation.

Figure 7-21. Typical Residential Lot Configure Along Escondido Beach

Figure 7-22. Beach Side of Residences Along Escondido Beach

7.4 Anthropogenic Sedimentation Assessment Summary and Conclusion

The assessment included a review of the topography, geology, land use, and imagery to determine potential areas prone to anthropogenic sedimentation. This review indicated that the topography, geology, and land use are related. Geologic processes, beginning as far back as 80 million years, formed the sedimentary formations predominantly found along the coast shoreline and Point Dume upland mesa area, which include siltstone and sandstone. Approximately 16 million years ago, seismic activity began and continued for 3 million years to form the Santa Monica Mountains, which are composed of a combination of sedimentary and igneous rock formations (City, 1995). Land use zoning and development along the coast line within ASBS 24 assessment area includes primarily large, single-family residences, and state, county, city, and private beach facilities.

The desktop analysis included in determining the general sediment risk for the area is based on the procedures outlined in the Construction General Permit. These procedures included determining the rainfall erosivity (R factor), which is based on data collected over several years to determine the annual storm kinetic energy, on average, for the area. That factor, combined with properties of common soils and various slopes (up to 50%) and heights (up to 50 ft.), were used to determine the potential annual soils for disturbed loose soil areas within the watershed. Calculation results indicated that the potential for soil loss within disturbed areas increases at a rapid rate for areas having slopes greater than 10% and heights of greater than a few feet. These results were used during field reconnaissance to aid in determining if areas have the potential to contribute anthropogenic sedimentation to ASBS 24.

Field reconnaissance was performed with a focus on the areas that drain to the identified potential discharge source locations along ASBS 24. In general, the drainage areas primarily consisted of larger lots (0.25 to approximately 1 acre) with existing residential structures, hardscape improvements, and landscaping. Landscape vegetative covers within the developed areas were observed to be well maintained. Small private drains were not observed to terminate where potential discharges could result in erosion (e.g., generally drains were observed to be routed completely down the sloped areas).

The natural slope and bluff areas located down-gradient of improvements were observed with good vegetation cover on the mild sloped area and less to no vegetation on the very steep/vertical bluff face. This is most likely due to the dense nature of the bluff sedimentary composition. Signs of rapid (unnatural) erosion were not observed on the very steep/vertical bluff faces (i.e., bluff in the developed areas looked similar to those in vacant/undeveloped areas of the assessment area).

The conclusion of the sediment identification assessment is that currently, there are no areas prone to anthropogenic sedimentation within the potential discharge source locations identified within the Parties' jurisdiction. Land use in the drainage areas consists predominantly of residential with some beach facility properties. The areas associated with residential properties were observed to have good vegetative cover and appeared to be regularly maintained by landscaping professionals. The natural slope and bluff areas located down-gradient of improvements were observed with good vegetative cover on the mild sloped area and less to no

vegetation on the very steep/vertical bluff face. This is most likely due to the dense nature of the bluff sedimentary composition. Signs of rapid (unnatural) erosion were not observed on the very steep/vertical bluff faces (i.e., bluff in the developed areas looked similar to those in vacant/undeveloped areas of the assessment area). Therefore, at this time, no additional sediment BMPs are required by this plan.

8.0 IMPLEMENTATION SCHEDULES

8.1 General Exception Schedule

The General Exception (Resolution No. 2012-0012) was adopted and became effective on March 20, 2012. Resolution No. 2012-0031 amended the General Exception to revise some of the sections to be consistent with other sections. The two documents collectively are referenced to as the General Exception, with Resolution No. 2012-0012 establishing the effective date and Resolution No. 2012-0031 providing referenced content. Table 8-1 provides a summary of the key milestones specified in the General Exception. The General Exception states that the Draft Pollution Prevention Plan shall be submitted to the State Board within 18 months of the effective date of the General Exception. However, due to the limited number of monitoring opportunities during the 2012-2013 wet season, the Parties requested and were granted an extension of 12 months to perform additional wet weather monitoring. This timeline extension is included in the summary table.

Table 8-1. General Exception Schedule of Milestones

Description	Duration	Date
Resolution No. 2012-012 (General Exception)		Adopted March 20, 2012
Resolution No. 2012-021 (Amended General Exception)		Adopted June 19, 2012
Non-authorized non-storm water discharges prohibited	Effective date of the General Exception	March 20, 2012
Nonstructural controls necessary to comply shall be implemented	18 months after the General Exception effective date	September 20, 2013
Draft Pollution Prevention Plan	*30 months after the General Exception effective date	September 20, 2014
Final Pollution Prevention Plan	*42 months after the General Exception effective date	September 20, 2015
Structural controls identified in Pollution Prevention Plan necessary to comply shall be operational	*7 years after the General Exception effective date	March 20, 2019
All discharges comply with the General Exception requirements	*7 years after the General Exception effective date	March 20, 2019

*Additional 12 months added to duration based on Draft Pollution Prevention Plan extension granted by the State Board to allow for additional wet weather core monitoring.

8.2 Nonstructural Controls Implementation Schedule

The Pollution Prevention Plan uses adaptive management (see Section 3.1.2) to plan, implement, assess, and refine nonstructural solutions implemented by the Parties in the ASBS 24 tributary drainage area. The initial assessment included special studies and existing PIPP, enforcement, and O&M nonstructural programs (see Appendix B); the Parties are currently meeting the compliance requirements detailed in the General Exception. The listed steps forward in this section include nonstructural programs that will allow the Parties to continue to be in compliance and may reduce wet weather pollutant loading. These steps forward include the following:

- Continue to implement, track, and refine effectiveness assessment protocols for nonstructural programs, as discussed in Section 3.0.

Table 8-2. Milestones and Schedule for Implementation of Enhanced Nonstructural Programs and Key Steps Forward

Timeline	Objective	Nonstructural Program(s) & Key Steps Forward
Initial Phase: 2005–2012	1. Understand baseline conditions in ASBS. 2. Identify/address dry-weather and storm water runoff. 3. Progress towards zero dry weather runoff.	Progressed towards existing nonstructural programs identified in Section 3.2.
Before September 20, 2013	Zero discharge of non-authorized non-storm water to ASBS 24.	▪ Public Outreach (see Section 3.2).
09/20/2013	Compliance with ASBS Special Protections for Dry Weather	
09/20/2014	Submit Draft ASBS Pollution Prevention Plan for ASBS 24	
Wet Weather: 2014–2015	1. Maintain zero dry weather runoff to ASBS 24. 2. Evaluate nonstructural BMPs that may provide wet weather load reductions.	▪ Feasibility assessment and initial outreach for metal building materials ordinances.
09/20/2015	Submit Final ASBS Pollution Prevention Plan for ASBS 24	
Wet Weather: 2015–2019	1. Maintain zero dry weather runoff to ASBS 24. 2. Evaluate nonstructural BMPs that may provide wet weather load reductions.	▪ Evaluate metal building materials ordinances and metal building material management incentive programs. ▪ Evaluate enhanced collaborative environmentally friendly alternative services program(s).

9.0 COST ESTIMATES

The Parties have implemented numerous nonstructural controls and related programs to eliminate non-authorized discharges to ASBS 24. The Parties continue to maintain these measures, and the annual estimated costs associated with the key programs, which are detailed in Section 3.0 and Appendix B, are provided on Table 9-1.

Table 9-1. Annual Nonstructural Program to Maintain Zero Dry Weather Flows Costs

Program Type	Program Name	Approximate Cost ($/year)
Public Information & Participation Programs (PIPP)	Rethink L.A.	[1]$10,000
	Los Angeles County Materials Exchange (LACoMAX)	Costs in Rethink L.A.
	Malibu Parks and Recreation Quarterly Newsletter	$33,000
	Living Lightly in Our Watersheds Environmental Guide	N/A (onetime cost)
	Coastal Preservation Specialist (CPS)	[2]$35,957
	ASBS Presentations and Community Meetings	Included in ASBS Focused Outreach Program
	ASBS Webpage	Included in ASBS Focused Outreach Program
	Malibu Green Room Webpage	[3]$4,000
	City of Malibu Clean Water Program and Clean Water Team	[3]$8,000
	Malibu Area Conservation Coalition	[3]$8,000
	Ocean Friendly Garden (OFG) Program	Included in ASBS Focused Outreach Program
	CA Friendly Landscaping Program	[3]$4,000
	Water District #29 Tiered Water Rates Based on Increased Usage	N/A
	Water Conservation Program – Water Saving Devices Rebate Program	[1]$5,000
	Cash for Grass	[1]$5,000
	Landscape Irrigation Efficiency Program (LIEP)	[1]$5,000
	Ocean Friendly Garden (OFG) Program	Included in ASBS Focused Outreach Program
PIPP Subtotal		**$117,957**
Enforcement	City Pollution Prevention Hotline	$600
	Pollution Prevention Hotline, 1(888)Clean LA	[1]$3,000
	ASBS Focused Outreach via Coastal Preservation Specialist (CPS)	[2]$35,957
	City Local Coastal Program	Included in Inspection
	Smoking at Beaches Ban	[1]$20,000
Enforcement Subtotal		**$59,557**
Total		**$177,514**

[1] Cost estimated based on fraction of regional program total cost (typically 5%).
[2] Coastal Preservation Specialist cost divided evenly between PIPP and enforcement.
[3] Cost estimated based on staff time to complete associated tasks.

10.0 REFERENCES

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APPENDIX A

Pollution Prevention Plan Map

POLLUTION PREVENTION PLAN MAP- AREA OF SPECIAL BIOLOGICAL SIGNIFICANCE (ASBS) 24

Legend

Potential Discharge Source Location
- Private or Undetermined Ownership (383)
- Los Angeles County (26)

Outfall Stations (Point Sources, See Compliance Plan)
- City, County, District, or Undetermined with Caltrans Inlet

Other Outfalls (Point Sources)
- District Undetermined
- Ownership Undetermined (County Recon)
- Private or Undetermined Ownership (City Recon)

Catch Basins
- City of Malibu
- District
- Road Maintenance Division
- Private or Undetermined Ownership

Other Storm Drain Features
- Inlet or Outlet Storm Drain Feature
- Storm Drain Line
- Storm Drain Channel
- Creek
- Planned BMP

Drainage Areas
- Delineated Catchments of Outfall Stations
- Overall ASBS Watershed Area
- Subbasins ASBS Watershed Area
- Subbasin Flow Direction Arrows
- Areas of Potential Sheet Flow

Sewer Facilities
- Sewer Treatment Plant
- Sewer Pump Station
- Sewer Pipe
- Sewer Maintenance Service Area

Roads
- Pacific Coast Highway
- Secondary - Collector
- Ramp
- Minor - Local
- Private Road

Hazardous Materials
- Facilities with Hazardous Material Storage Areas

Jurisdictional Boundary
- County Boundary
- Unincorporated Area of Los Angeles County
- City of Malibu

State and Federal Lands
- State of California
- Federal Land

Other Boundaries and Zones
- ASBS-24
- USGS Landslide Zones (digital version only)

Notes:
1. Potential discharge sources are those not regulated under the NPDES permit and listed as ASBS discharge locations in the Program Final EIR (SWRCB, 2012b).
2. Data subject to revision
3. No areas prone to erosion have been identified

DRAFT 9/17/14

0 0.25 0.5 0.75 1 Miles

ASBS-24

PACIFIC OCEAN

VENTURA COUNTY
LOS ANGELES COUNTY

Leo Carillo State Park
Leo Carillo State Beach
Nicholas Canyon Beach (County)
Malibu Springs Open Space
Charmlee County Park
Robert H. Meyer Memorial State Beach
Broad Beach
Trancas Beach
Broad Beach Road Biofiltration Project
Zuma Beach (County)
Santa Monica Mountains National Recreation Area
Point Dume Beach a.k.a. Westward Beach (County)
Paradise Cove
Escondido Falls
Escondido Beach (County)

Mulholland Hwy
State Rte 23
Pacific Coast Hwy
Decker Canyon Rd
Lechusa Rd
Encinal Canyon Rd
Kanan Rd
Co Hwy N9
S Kanan Dume Rd
Latigo Canyon Rd
Little Sycamore Canyon Rd

Arroyo Sequit
San Nicholas Canyon Creek
Los Alisos Canyon
Los Alisos Canyon Creek
Lechusa Canyon
Lechusa Canyon Creek
Hartnell Canyon
Hartnell Canyon Creek
Tramposa Canyon
Zuma Canyon
Kanan Dume Rd
Ramirez Canyon
Yerba Buena Creek
Ramirez Canyon Creek
Escondido Canyon
Escondido Canyon Creek

Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013

APPENDIX B

Existing Dry Weather Flow Prevention Nonstructural Programs Table

Existing Dry Weather Flow Prevention Nonstructural Programs Within the ASBS 24 Area

Non-structural Program	Program Sub-category	Name of Nonstructural Control	Project Descriptions for Existing Nonstructural Controls	Project Location	Target Source/ Target Audience	Targeted Water Quality Problem	Method of Measure	Program Start Date	Implementation Status/ Completion Date	Lead Agency	Approx. Cost ($/year)
PIPP	Education, Waste Manage-ment	Rethink L.A.	Education and outreach program designed to encourage "rethinking" about waste management, including opportunities to implement reduction, recycling, and reuse. Program provides resources for buying recycled products and encourages carbon footprint BMPs, including a carbon footprint calculator, energy efficiency tips, and means of alternative transportation. (LACDPW, 2014)	Regional	Residential, Commercial, Industrial	Trash, Urban Runoff	# Website visits # Workshops # Brochures # Attendees Regional Recycling Rate	-	Ongoing implementation	Los Angeles County	$200K *(Regional)*
PIPP, O&M	Education, Waste Managemen t	Los Angeles County Materials Exchange (LACoMAX)	The goal of this program is to reduce waste transported to the landfill. The LACoMAX is an on-line service where the public may find, make available, or identify an entrepreneurial opportunity for discarding resource materials. The data platform includes 15 material classifications and six regions. It is also a location where garage sales may be advertised. The data platform provides information to other County waste management programs.	Regional	Residential, Commercial, Industrial, Construction	Trash, Urban Runoff	# Website visits # Workshops # Brochures # Attendees Regional Recycling Rate	-	Ongoing implementation	Los Angeles County	See Rethink L.A. program
PIPP	Education	Malibu Parks and Recreation Quarterly Newsletter	The Malibu Recreation Guide and Quarterly Newsletter is sent to residents and includes articles related to the Clean Water Program and Solid Waste Program. The City takes the opportunity to give reminders to the community about how to prevent pollution and reduce waste, as well as local event opportunities. The newsletters are also available at City Hall. ASBS articles have been regularly contributed to each issue since 2012.	City of Malibu	Residential	Urban Runoff	4 Issues/year # Newsletters mailed	December 1995	Ongoing implementation	City of Malibu	$33,000
PIPP	Education	Malibu Chamber of Commerce Environmental Committee	The City is an active participant in the Malibu Chamber of Commerce Environmental Committee which aims to provide education and learning opportunities and recognition to local businesses and community through events, awards, workshops, and outreach campaigns.	Regional	Commercial, Residential	Urban Runoff, Water Conservation Trash/Recycling	# Workshops # Attendees # Brochures distributed	September 1999	Ongoing implementation	Malibu Chamber of Commerce	Not Applicable
PIPP	Education	Clean Water Act and Our Backyards Video	The Clean Water Act and Our Backyards video was produced locally in partnership with the Malibu Creek Watershed Council. It is regularly played on cable, and at local events and trainings. It gives an overview of how routine activities can affect water quality, BMPs to prevent pollution, and an explanation of TMDLs.	Regional	Residential	Urban Runoff	# Video presentations # Attendees/presentati on	January 2002	Ongoing implementation	Malibu Creek Watershed Council	Not Applicable
PIPP	Education	*Living Lightly in Our Watersheds* Environmental Guide	The City and County collaborated with the Resource Conservation District of the Santa Monica Mountains in the revision and distribution of the *Living Lightly in Our Watersheds: A Guide for Residents of the Santa Monica Bay Watersheds* (Malibu Creek Watershed Advisory	Regional	Residential, Commercial	Urban Runoff	# Guides mailed # Visits to the website	July 2005	Ongoing implementation	Malibu Creek Watershed Council	$3,000 (City of Malibu) $20,000 (County of

Existing Dry Weather Flow Prevention Nonstructural Programs Within the ASBS 24 Area

Non-structural Program	Program Sub-category	Name of Nonstructural Control	Project Descriptions for Existing Nonstructural Controls	Project Location	Target Source/ Target Audience	Targeted Water Quality Problem	Method of Measure	Program Start Date	Implementation Status/ Completion Date	Lead Agency	Approx. Cost ($/year)
			Council, 2005). The guide was distributed to all Malibu residences and businesses. The City contributes to printing costs and distribution by mail and distributes materials at events. A new web-based and mobile platform is currently under development and is expected to launch by 2015. A new print edition of the guide is also expected in 2015.								Los Angeles)
PIPP	Education	*Malibu Life* Environmental Newsletter	*Malibu Life* (formerly *Malibu Current*) Environmental Quarterly Newsletter is sent to all Malibu residences and businesses and distributed continuously to educate about ongoing environmental concerns and what the community can do to help, and provides updates on City environmental projects and programs. An ASBS article was published in Issue 2 Volume 1 in April 2007.	Regional	Residential	Urban Runoff, Water Conservation	# Articles # Newsletters mailed	April 2007	Implementation halted in 2010	City of Malibu	-
PIPP	Education	Wildlife and Marine Rescue Services	The City has had a contract with the California Wildlife Center since April 1996 to provide wildlife rescue services and was later amended to include marine mammal rescue services. In 2003, the City, in partnership with the California Wildlife Center, applied for and received a John H. Prescott Marine Mammal Rescue Assistance Grant. Wild Rescue is a secondary responder. Public outreach and education are also a part of the grant.	City of Malibu	Residential	Urban Runoff, Water Conservation	# Outreach events supported	March 1992	Ongoing implementation	City of Malibu, California Wildlife Center	$2,500 (FY 13-14) *($1,000-$2,500 historically)*
PIPP / Enforcement	Education, Inspections, Incentives/ Enforcement	ASBS Focused Outreach Program – Proposition 84 Project	This began as a Proposition 84 grant program officially titled the Wildlife Road Treatment & ASBS Focused Outreach Program Proposition 84 Project. The temporary Coastal Preservation Specialist (CPS) position was created to perform outreach to the community. The CPS regularly conducted field work throughout the ASBS area, including coastal and inland areas, to look for dry-weather runoff and other pollution threats. When individual properties were identified as being out of compliance with ASBS regulations, a letters to "cease and desist" the discharge and educational materials were mailed. The City, via the CPS and /or other City staff worked with the property owners to help fix the problem. The property owner was required to submit a report detailing how the problem was fixed. The CPS and / or other City staff conducted site visits, continued monitoring the site, and performed other additional actions (case-specific). General letters, including Notices to Comply, were sent to neighborhoods and individuals of high priority that were considered more likely to impact the	ASBS 24 (Area in Malibu city limits)	Residential, Commercial	Urban Runoff, Water Conservation	# ASBS letters mailed # Cease and Desist letters mailed # Follow-up 1-month reports submitted % Compliance with Orders to Cease and Desist Discharge # Notices to Comply letter mailed to high-priority addresses % Change in high-priority addresses. Photo documentation	November 2011	Ongoing implementation End of grant: July 2014 City Continuing Program	City of Malibu	$71,914 (grant)

Existing Dry Weather Flow Prevention Nonstructural Programs Within the ASBS 24 Area

Non-structural Program	Program Sub-category	Name of Nonstructural Control	Project Descriptions for Existing Nonstructural Controls	Project Location	Target Source/ Target Audience	Targeted Water Quality Problem	Method of Measure	Program Start Date	Implementation Status/ Completion Date	Lead Agency	Approx. Cost ($/year)
			ASBS to inform them of ASBS discharge restrictions. A general ASBS letter was mailed to every parcel within the ASBS. A database with information on every case is maintained as issues arise in the ASBS watershed and includes all communications and photos. The project also included the installation of a structural BMP on Wildlife Road. The City plans to continue this program on a modified scale.								
PIPP	Education	Community Meetings and ASBS Presentations	Outreach presentations to home owner associations, property owner associations, and other community groups about the City's Clean Water Program, including protecting water quality and conserving water have been conducted. Recent outreach by the CPS was about urban runoff and the ASBS.	ASBS 24 (Area in Malibu city limits)	Residential	Urban Runoff	# Presentations	October 2007	Ongoing implementation End of grant: July 2014	City of Malibu	See ASBS Focused Outreach Program
PIPP	Education	Point Dume Marine Science School Assembly and Science Projects	The City has collaborated with the Point Dume Marine Science School on various programs since 2005. More recently, an assembly to grades K-5 was conducted including a presentation on the water cycle, urban runoff, and how to prevent pollution from reaching the ASBS. Each grade level then completed a science project related to some component of the assembly at the appropriate grade level. A video of the science day was filmed and posted on the City's YouTube channel. The assembly and project was implemented by the CPS as part of the ASBS Focused Outreach Program.	Point Dume Marine Science School	Students (Residents)	Urban Runoff	# Students # Science day projects # Video views/year	2005	Completed May 2012	City of Malibu	See ASBS Focused Outreach Program
PIPP	Training	In-House ASBS Training	City staff has been trained multiple times about the ASBS. The most recent training in November 2012 discussed what to look for in the field, and how to work on ASBS cases. Binders with inspection report forms and educational handouts were created and placed in each City vehicle.	City of Malibu, City Hall	City Staff	Urban Runoff	# Staff trained	2007	Ongoing implementation	City of Malibu	See ASBS Focused Outreach Program
PIPP	Education	ASBS Webpage	An ASBS section is on the City of Malibu website. The webpage provides interactive maps and information about ASBS, including many educational resources to help residents, businesses, and visitors understand and comply with ASBS regulations. Events, rebates, and other incentive programs are also posted. The web-page section can be viewed at this link www.malibucity.org/ASBS. (City of Malibu, 2014A).	City of Malibu, Website	Residential, Commercial, Visitors	Urban Runoff, Water Conservation	# ASBS page views/year	May 2012	Ongoing implementation	City of Malibu	See ASBS Focused Outreach Program
PIPP	Education	Keep it Clean, Malibu Campaign	As part of the Proposition 84 State funding, an outreach campaign was developed (as an item in the CPS scope of work) to educate people about the issue and the result was Keep it Clean,	City of Malibu, Website, Social	Residential, Commercial, Visitors	Urban Runoff, Water Conservation, Pollution	# of "likes" # of tags on social media # ASBS video views	April 2014	Ongoing implementation	City of Malibu	See ASBS Focused Outreach Program

Existing Dry Weather Flow Prevention Nonstructural Programs Within the ASBS 24 Area

Non-structural Program	Program Sub-category	Name of Nonstructural Control	Project Descriptions for Existing Nonstructural Controls	Project Location	Target Source/ Target Audience	Targeted Water Quality Problem	Method of Measure	Program Start Date	Implementation Status/ Completion Date	Lead Agency	Approx. Cost ($/year)
			Malibu – a multi-platform educational campaign designed to positively and proactively teach about the ASBS, and make people think about storm drains and what goes into them. The campaign contains five main elements: storm drain art murals and associated educational video, 4 public Service videos, a robust social media campaign, special events, and collateral materials giveaways that featured the campaign slogan and ASBS logo. The campaign can be viewed on this web-page www.malibucity.org/keepitclean.	Media		Prevention	# of pledges signed/year				
PIPP	Education	Malibu Green Room Webpage	This is an overview of City's sustainability practices, environmental projects, ordinances, and regulations, including coastal water protection and water drought response. Rebates and incentives provided by partner agencies are included on this web-page. The Green Room can be accessed from the Environmental Programs main page from this web-page www.malibucity.org/environmentalprograms. (City of Malibu, 2014B)	Regional, City of Malibu, Website	Residential, Commercial	Urban Runoff, Water Conservation	# Malibu Green Room views/year	June 2012	Ongoing implementation	City of Malibu	Staff Time
PIPP	Education	City of Malibu Clean Water Program and Clean Water Team	The City's Clean Water Program and Team were formed with the ultimate goal of reducing or eliminating dry weather flow to the City's storm drains. It includes education of the businesses, residents, and visitors on water quality issues and BMPs and encourages participating in the team. It is the overlying program that manages regulatory compliance (e.g., NPDES, TMDLs), education, training, inspections and incidents response, and public agency activities. Outreach is provided on the City's website, at public speaking events, on local cable stations, at community events, and on distributed materials.	City of Malibu	Residential, Commercial	Urban Runoff, Storm Water Runoff	See other activities for defined metrics.	July 2002	Ongoing implementation	City of Malibu	Staff Time and Professional Services
PIPP	Education, Incentives	Malibu Area Conservation Coalition	The Malibu Area Conservation Coalition (MACC) is a partnership of local government agencies, utilities, resource districts, and community stakeholders working within Malibu and the North Santa Monica Mountains that share the common goal of empowering local communities to conserve and protect natural and economic resources and habitat. Recognizing that watersheds, oceans, water, and power generation and delivery systems do not stop at jurisdictional boundaries, the coalition is dedicated to providing effective programs, environmental education, and outreach. MACC members work on joint projects and also cross-promote individual organizations' programs.	City of Malibu	Residential, Commercial	Trash, Urban Runoff, Water Conservation	# Participants # Events (certain programs will have more defined metrics)	August 2009	Ongoing implementation	City of Malibu	Staff Time

Existing Dry Weather Flow Prevention Nonstructural Programs Within the ASBS 24 Area

Non-structural Program	Program Sub-category	Name of Nonstructural Control	Project Descriptions for Existing Nonstructural Controls	Project Location	Target Source/ Target Audience	Targeted Water Quality Problem	Method of Measure	Program Start Date	Implementation Status/ Completion Date	Lead Agency	Approx. Cost ($/year)
			Recent programs include Ocean Friendly Garden Program, Landscape Irrigation Efficiency Program, Cash for Grass, Earth Day festivals, and the Wild and Scenic Film Festival.								
PIPP	Education, Incentives	CA Friendly Landscaping Program	The CA Friendly Landscaping Program targets residences and businesses to promote water conservation and eliminate non-point source pollution from landscaping. It is a reimagining of the OFG Program by the Metropolitan Water District in an attempt to engage a broader audience statewide. Similarly to the OFG Program, it is promoted by its local water Districts and agencies. The program includes educational workshops, training events, and incentives such as landscape water efficiency rebates. The City hosted two CA Friendly Landscaping Workshops from 2013-2014.	Regional	Residential, Commercial	Urban Runoff, Water conservation, Pollution prevention	# Events/year # Attendees/event # Participants/incentive program	2013	Ongoing implementation	West Basin Municipal Water District, Los Angeles County Waterworks District 29, City of Malibu	Staff Time
PIPP	Education, Incentives	Ocean Friendly Garden (OFG) Program	The OFG Program is grant funded and targets residences and businesses in the ASBS to promote water conservation and eliminate non-point source pollution from landscaping. The program includes educational workshops, training events, irrigation controller rebates, and the design/build of demonstration gardens. The Bluffs Park OFG was redesigned and rebuilt (February-March 2013) into a demonstration garden. Outreach Events include: * Ribbon cutting ceremony (3/20/2013) * OFG Workshop (6/2013) * Urbanite Workshop * Chumash Day PowWow (4/13-14/2013)	Regional, Bluffs Park OFG	Residential, Commercial	Urban Runoff	# Events/year # Attendees/event # Demonstration gardens constructed	April 2009	Ongoing implementation	Surfrider, West Basin Municipal Water District, City of Malibu	See ASBS Focused Outreach Program for education. *OFG cost not included*
PIPP	Education, Incentives	CA Friendly Landscaping Program	The CA Friendly Landscaping Program targets residences and businesses to promote water conservation and eliminate non-point source pollution from landscaping. It is a reimagining of the OFG Program by the Metropolitan Water District in an attempt to engage a broader audience statewide. Similarly to the OFG Program, it is promoted by its local water Districts and agencies. The program includes educational workshops, training events, and incentives such as landscape water efficiency rebates. The City hosted two CA Friendly Landscaping Workshops from 2013-2014.	Regional	Residential, Commercial	Urban runoff, Water conservation, Pollution prevention	# Events/year # Attendees/event # Participants/incentive program	2013	Ongoing implementation	West Basin Municipal Water District, Los Angeles County Waterworks District 29, City of Malibu	Staff Time

Existing Dry Weather Flow Prevention Nonstructural Programs Within the ASBS 24 Area

Non-structural Program	Program Sub-category	Name of Nonstructural Control	Project Descriptions for Existing Nonstructural Controls	Project Location	Target Source/ Target Audience	Targeted Water Quality Problem	Method of Measure	Program Start Date	Implementation Status/ Completion Date	Lead Agency	Approx. Cost ($/year)
PIPP	Education	Pepperdine Business School Sustainability Project	Pepperdine business students created urban runoff and ASBS outreach materials, including posters and videos (available in English and Spanish). Materials are available on the Protect the Coast section on the Malibu City website. The students also mapped the process to develop a potential OFG Program on campus, created a guide for a green business certification program, and researched compliance and opinion of a local water ordinance as part of a project management class.	Pepperdine University	Residential, Commercial	Urban Runoff	# Videos created (2) # Posters created Pepperdine OFG guide	January 2012	Completed March 2012	Pepper-dine University, City of Malibu	See ASBS Focused Outreach Program
PIPP	Incentive	Water District #29 Tiered Water Rates Based on Increased Usage	Los Angeles County Water District 29 has implemented tiered water rates based on increased usage to encourage water conservation and reduce water waste to provide economic incentive to reduce landscape irrigation runoff.	City of Malibu	Residential, Commercial	Urban Runoff, Water Conservation	Regional change in water usage over time	February 2003	Ongoing implementation	Los Angeles County Water District #29	-
PIPP	Education	Water Conservation Program	This program is an education and incentive program promoting water conservation. Educational information on water conservation is provided on the website and distributed at workshops. An education program targeted at students (3rd-12th grade) has also been developed.	Regional	Residential, Commercial	Urban Runoff, Water Conservation	# Site visits # Workshops	April 2009	Ongoing implementation	Los Angeles County Water-works	Regional Program Cost
PIPP	Education, Incentives	Water Conservation Program – Water Saving Devices Rebate Program	Rebates are offered for water saving devices, including high-efficiency washing machines, sprinkler nozzles, and irrigation controllers. Rebates of $25 to $100 per irrigation controller, depending upon Water District and property (capped at $235/applicant), are provided.	Regional	Residential, Commercial	Urban Runoff, Water Conservation	# Rebates obtained *Assumed up to 15% runoff reduction per site*	April 2009	Ongoing implementation	Los Angeles County Water-works	Regional Program Cost
PIPP	Incentives	Cash for Grass (and other turf removal program iterations)	Through this program, residents are offered a rebate of $1 per square foot of grass replaced with water-efficient landscaping (i.e., native plants, mulch, un-grouted stepping stones, permeable hardscape, and crushed rock). The goal of this program is to encourage water conservation for outdoor landscaping methods, including native plantings, using mulch, and installing permeable pavers.	Regional	Residential, Commercial	Urban Runoff, Water Conservation	# Applications # Completed projects $ Rebates	April-09	Ongoing implementation	Los Angeles County Water-works	Regional Program Cost
PIPP	Incentives	Landscape Irrigation Efficiency Program (LIEP) (and other water efficiency evaluation programs)	This grant funded program consisted of free water use surveys of properties by a certified landscape professional. The program also included free installation of efficient irrigation controllers (i.e., rotator sprinklers in place of conventional spray heads) for qualified sites. Programs of this type are ongoing and evolving as funding arises.	Regional	Residential, Commercial	Urban Runoff, Water Conservation	# Surveys # Sprinklers exchanged *Assumed up to 70% runoff reduction per site*	April 2009	Ongoing implementation as funding and resources allow	West Basin Municipal Water District	Regional Program Cost

Existing Dry Weather Flow Prevention Nonstructural Programs Within the ASBS 24 Area

Non-structural Program	Program Sub-category	Name of Nonstructural Control	Project Descriptions for Existing Nonstructural Controls	Project Location	Target Source/ Target Audience	Targeted Water Quality Problem	Method of Measure	Program Start Date	Implementation Status/ Completion Date	Lead Agency	Approx. Cost ($/year)
PIPP	Education	Billboard Educational Campaign	This program was a countywide, 8-week billboard campaign designed to promote protective waste management practices. A used motor oil educational advertisement was displayed on 20 billboards throughout Los Angeles County.	Regional	Residential, Commercial	Bacteria, Oil, Urban Runoff	Route of advertisements # Impressions	February 13, 2012	Completed April 2012	District, Los Angeles County	-
Enforcement	Reporting	City of Malibu Pollution Prevention Hotline	A 24-hour, bilingual hotline was launched in 2012 to enhance the IC/ID program. The goal of this program is to offer a reporting tool to citizens during non-business hours and provide staff with an opportunity to quickly respond to spills or runoff that may pollute streams or coastal waters. The community may call 310-359-8003 to report incidents.	Regional	Residential, Commercial	Urban Runoff	# Hotline calls/year # IC/ID abated/year due to hotline	June 2012	Ongoing implementation	City of Malibu	$600 (FY 13-14, phone)
Enforcement	Reporting	Pollution Prevention Hotline, 1(888)Clean LA	A 24-hour, bilingual hotline offers County staff, cities, and the public a means to report spills or runoff that may pollute coastal waters. Calls are received and dispatched to the appropriate personnel for investigation and resolution. The hotline is available in English and Spanish. A Chinese hotline is also available in Mandarin.	Regional	Residential, Commercial, Industrial	Urban Runoff	# Hotline calls/year # IC/ID abated/year due to hotline	November 1997	Ongoing implementation	Los Angeles County, District	-
Enforcement	Reporting and Education	City of Malibu Water Waster Online Reporting Form	An online form to allow the community to report water waste has been introduced. All stakeholders are encouraged to make a collective effort to use water wisely, eliminate runoff, and reduce water waste, creating a culture of water conservation and water quality protection, and keep each other accountable by talking with those they see wasting water and using the reporting form. The form includes options to report issues included in the City's water conservation code. The City will provide notice, education and enforcement where needed to resolve issues. The online Water Waster Report form can be found at this link www.malibucity.org/WaterWaster	Regional	Residential, Commercial	Water Conservation, Urban Runoff	# Reports/year # Reports which included runoff abated/year	September 2014	Ongoing implementation	City of Malibu	Staff Time
Enforcement	City Planning	City of Malibu Local Coastal Program	The City of Malibu Local Coastal Program, as certified by the California Coastal Commission, includes the Land Use Plan (LUP) and Local Implementation Plan (LIP) that details many environmental quality and protection standards, objectives, and implementation measures for new development and redevelopment projects.	Regional	Construction	Trash, Sediments, Urban Runoff, Storm Water Runoff	See Construction Inspection Program (Compliance Plan)	September 1998	Ongoing implementation	City of Malibu	Part of Commercial & Industrial Inspection Program
Enforcement	Code Enforcement	Smoking at Beaches Ban	The Los Angeles County Sheriff engages Beach Patrol for enforcement of Ordinance No. 265, M.M.C. Chapter 12.05.035, Smoking at Beaches Ban.	Regional	Residential, Commercial	Trash, Urban Runoff	21 miles of beaches patrolled	May 2000	Ongoing implementation	City of Malibu	$482,983

APPENDIX B REFERENCES

LACDPW (Los Angeles County Department of Public Works), 2014. *Rethink LA Website*, Retrieved April 2014. Accessed at: http://dpw.lacounty.gov/epd/rethinkla/rethink/

City of Malibu, 2014A. *Areas of Special Biological Significance Website*. Retrieved April 2014. Accessed at: http://www.malibucity.org/index.aspx?NID=268

City of Malibu, 2014B. *Malibu Green Room Website*. Retrieved April 2014. Accessed at: http://www.malibucity.org/index.aspx?NID=268

Malibu Creek Watershed Advisory Council, 2005. *Living Lightly in Our Watersheds, A Guide for Residents of the North Santa Monica Bay Watersheds.* Available at: http://www.conservation.ca.gov/dlrp/watershedportal/Documents/Living%20Lightly%20in%20our%20Watersheds%20(rcd%20of%20the%20santa%20monica%20mo.pdf

APPENDIX C

Potential Enhanced Nonstructural Programs Table

Potential Nonstructural Program Enhancements to Achieve Additional Wet Weather Load Reductions

Nonstructural Program	Program Sub-Category	Name of Nonstructural Control	Project Descriptions for Enhanced Nonstructural Controls	Target Source/ Target Audience	Targeted Water Quality Problem	Method of Measure	Lead Agency	Implementation Cost (Approx.)
PIPP	Education, Incentives	Enhanced Collaborative Environmentally Friendly Alternative Services Program	This program would look for opportunities to enhance existing environmentally friendly services programs. For example, the LACoMAX could include an ASBS-specific region search and/or the City of Malibu could provide a link to via the Malibu Green Room webpage, with information related to local exchanges, a list of consignment facilities, etc. Programs that may also be enhanced in the future include the Clean Bay Restaurant Certification Program, City of Malibu's EPPP and RCP, and Los Angeles County's Rethink LA Program.	Residential, Commercial	Urban Runoff, Trash	Program-specific metrics will be developed	Los Angeles County, City of Malibu, Malibu Chamber of Commerce	$5K / Year
PIPP	Education	ASBS Signage at Beaches	Educational placards describing the ASBS would be developed and installed along the board walk and/or main public beach accesses along the ASBS. This signage would describe unique features of the ASBS, as well as highlight recommended BMPs for trash management, sediment management, irrigation control, etc.	Residential, Public	Urban Runoff, Trash	# placards installed, # beach visits/year	Los Angeles County, State of California	$20K
PIPP	Education, Incentives	Architectural Copper and Metal Building Material Mitigation Program	This program would offer rebates for architectural copper and zinc mitigation measures. Rebates would be offered for existing structures and could be modeled after the Grass for Cash program. Potential mitigation measures may include: application of sacrificial paint (e.g., copper and zinc oxidation protection paints), downspout diversions, rain barrels and cisterns. Information could be incorporated into existing educational materials and through the, ASBS Focused Outreach program, etc.	Residential, Commercial	Metals	# rebates offered, # facilities mitigated	City of Malibu, Los Angeles County	$150K / Year
PIPP / Enforcement	City Ordinance, Education, Enforcement	Architectural Copper Ban	Monitoring data of storm water wash off collected from metal building materials have been shown to be associated with elevated copper levels (City of San Diego, 2009 and 2010a). This ordinance would prohibit use of architectural copper for all new developments and re-development projects, especially for buildings and facilities along the ASBS and PCH. This ordinance would likely require significant education and outreach to engineers and architects, as well as residents and general public.	Residential, Commercial	Copper	# brochures distributed, # workshops, Ordinance/Policy, # facilities enforced	City of Malibu	$5K
PIPP / Enforcement	City Ordinance, Education, Enforcement	Zinc Alternative Building Material Ordinance	It is recognized that for maintenance and durability, building materials are often specified as galvanized zinc. Monitoring data collected of storm water wash off from metal building materials have been shown to be associated with elevated zinc levels. This project would evaluate the feasibility and implement a zinc building material policy which would eliminate, reduce, mitigate or control the use of zinc building materials, based upon the findings of a feasibility analysis and stakeholder engagement process.	Residential, Commercial	Zinc	Feasibility analysis, Ordinance/Policy	City of Malibu	$10K + $5K/Year *(outreach)*

APPENDIX D

Enhanced Nonstructural Programs

Quantification Calculations

- Building Material Management Program

Simple Method Model to Estimate Copper Load Reduction Associated with Nonstructional BMP Program

Watershed Parameters

Area	1	ac	
Rainfall	1	inch	
Percent of Resid that have cu	25%		
w/cu material factor	25	times std EMC	
Residential Cu EMS (w/cu)	432.5	ug/L	
Residential Cu EMC	17.3	ug/L	(LARWQCB, 2005)
Open Space Cu EMC	9.1	ug/L	(LARWQCB, 2005)
Transportation Cu EMC	51.9	ug/L	(LARWQCB, 2005)

Land Use	Coverage	Impervious %	**Rv Value**
Residential	50%	35%	0.365
Open Space	40%	3%	0.077
Transportation	10%	75%	0.725

Base Line (Exisiting Conditions No Program)

Calculations:

Land Use	Coverage	Impervious %	**Rv Value**	Cu EMC (ug/L)	Loading (kg/(1-in*1 ac)
Residential Cu EMS (w/cu)	12.5%	35%	0.365	432.5	0.0219
Residential Cu EMC	37.5%	35%	0.365	17.3	0.0026
Open Space Cu EMC	40.0%	3%	0.077	9.1	0.0003
Transportation Cu EMC	10.0%	75%	0.725	51.9	0.0042
Total	**100.0%**				**0.0290**

With Program - Lower End of Reductions Based on Stated Asssumptions

Assumptions:		Results	
Percent of Program Utilization	20.0%	Load Reduction =	6.0%
Load Reduction	40.0%		

Calculations:

Land Use	Coverage	Impervious %	**Rv Value**	Cu EMC (ug/L)	Loading (kg/(1-in*1 ac)
Residential Cu EMS (w/cu)	10.00%	35%	0.365	432.5	0.0175
Residential Cu EMS (w/cu) on Program	2.50%	35%	0.365	259.5	0.0026
Residential Cu EMC	37.5%	35%	0.365	17.3	0.0026
Open Space Cu EMC	40.0%	3%	0.077	9.1	0.0003
Transportation Cu EMC	10.0%	75%	0.725	51.9	0.0042
Total	**100.0%**				**0.0273**

With Program - Upper End of Reductions Based on Stated Asssumptions

Assumptions:		Results	
Percent of Program Utilization	20.0%	Load Reduction =	12.1%
Load Reduction	80.0%		

Calculations:

Land Use	Coverage	Impervious %	**Rv Value**	Cu EMC (ug/L)	Loading (kg/(1-in*1 ac)
Residential Cu EMS (w/cu)	10.00%	35%	0.365	432.5	0.0175
Residential Cu EMS (w/cu) on Program	2.50%	35%	0.365	86.5	0.0009
Residential Cu EMC	37.5%	35%	0.365	17.3	0.0026
Open Space Cu EMC	40.0%	3%	0.077	9.1	0.0003
Transportation Cu EMC	10.0%	75%	0.725	51.9	0.0042
Total	**100.0%**				**0.0255**

LARWQCB (Los Angeles Regional Water Quality Control Board). 2005. Total Maximum Daily Load for Toxic Pollutants in Marina del Rey. October 6, 2005. EMCs were estimated based on LADPW's stormwater data from 1994 to 2000.