California Regional Water Quality Control Board

San Diego Region

Sediment TMDL for Los Peñasquitos Lagoon

DRAFT

STAFF REPORT

MayFebruary 159, 2012

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Sediment TMDL
Los Peñasquitos Lagoon

Draft
Staff Report

Adopted by the
California Regional Water Quality Control Board
San Diego Region
on _____, 201x

Approved by the
State Water Resources Control Board
on _____, 201x
and the
Office of Administrative Law
on _____, 201x
and the
United States Environmental Protection Agency
on _____, 201x

Cover Photograph by Cathryn Henning

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City of Del Mar

City of Poway
County of San Diego
Caltrans
Los Peñasquitos Lagoon Foundation
California State Parks
San Diego Coastkeepers
Coast Law Group
Tetra Tech, Inc., led by Stephen Carter, P.E. and Clint Boschen
US Environmental Protection Agency

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Abbreviations:

BAT:	Best Available Technology
BMP:	Best Management Practice
CWA:	Clean Water Act
CFR:	Code of Federal Regulations
EFDC:	Environmental Fluids Dynamic Code
EMC:	Event Mean Concentration
LA:	Load Allocation
LSPC:	Loading Simulation Program in C++
MLS:	Mass Loading Station
MOS:	Margin of Safety
MS4:	Municipal Separate Storm Sewer System
NPS:	Non-point Source Pollution
NPDES:	National Pollutant Discharge Elimination System
SANDAG:	San Diego Association of Governments
TBELs:	Technology Based Effluent Limitations
TMDL:	Total Maximum Daily Load
TSS:	Total Suspended Solids
TWAS:	Temporary Watershed Assessment Stations
US EPA:	United States Environmental Protection Agency
USGS:	Unites States Geological Survey
WQOs:	Water Quality Objectives
WLA:	Wasteload Allocation
WDRs:	Waste Discharge Requirements
WQBELs:	Water Quality Based Effluent Limitations (WQBELs)

Acknowledgements

This TMDL was developed as part of a third party effort. Many dedicated professionals contributed to this Staff Report through their service as a member of ~~on~~ the ~~Stakeholder Advisory Group (SAG)~~third party stakeholder group for this TMDL project. This project was funded in part by the City of San Diego to provide technical support from Tetra Tech, Inc., in developing the Technical Support Document, which provided the foundation for this TMDL. In addition, the ~~SAG~~ third party stakeholder group reviewed issues for scientific peer review, raised important policy issues, and assisted with drafting the Staff Report. The California Regional Water Quality Control Board, San Diego Region, would like to thank the individuals who participated in the third party stakeholder group ~~served on the SAG~~ for their significant contributions to this project.

Members of the Stakeholder Advisory Group during a field visit to Los Peñasquitos Lagoon. (Pictured from left: Jay Shrake, Roshan Sirimanne, Clint Boschen, Kelly Barker, Charles Cheng, Ken Johansson, Ruth Kolb, Cheryln Cac, Judith Guttierrez~~City of San Diego Employee~~, Cathryn Henning, Malik Tamimi, Mike Hastings.)

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Executive Summary

This staff report supports tentative Resolution No. R9-2012-0033, which will amend the *Water Quality Control Plan for the San Diego Basin (9)* (Basin Plan) to incorporate the sediment Total Maximum Daily Load (TMDL) for Los Peñasquitos Lagoon (Lagoon). The Basin Plan amendment will incorporate the TMDL, associated wasteload allocations, and required load reductions into the Basin Plan. This TMDL addresses the Clean Water Act section 303(d) sediment impairment for the Lagoon.

Water Quality Impairment of Los Peñasquitos Lagoon

Los Peñasquitos Lagoon is one of the few remaining and irreplaceable coastal lagoons in southern California providing valuable estuarine habitat as well as numerous other important beneficial uses. Over the course of the 20th century, the Lagoon has incurred a number of anthropogenic disturbances which, cumulatively have resulted in excessive sedimentation and the gradual degradation and loss of the estuarine habitat.

As required by section 303(d) of the Clean Water Act, the Lagoon was placed on the 1996 List of Water Quality Limited Segments due to sedimentation and siltation loads that exceeded water quality objectives. The beneficial uses that are most sensitive to increased sedimentation are estuarine habitat (EST) and preservation of biological habitats of special significance (BIOL). Estuarine uses of the Lagoon may include preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (such as marine mammals or shorebirds). Other beneficial uses listed in the Basin Plan for the Lagoon include contact water recreation, non-contact water recreation, wildlife habitat, rare, threatened or endangered species, marine habitat, migration of aquatic organisms, spawning, reproduction and/or early development, and shellfish harvesting.

Impacts associated with increased and rapid sedimentation include: reduced tidal mixing within Lagoon channels, degraded and (in some ~~cases~~areas) net loss of saltmarsh vegetation, increased vulnerability to flooding for surrounding urban and industrial developments, increased turbidity associated with siltation in Lagoon channels, and constricted wildlife corridors.

The water quality objective for sediment is contained in the Basin Plan. The Basin Plan states, “The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.”

Numeric Target

The sediment water quality standard applies to sediment loading to the Lagoon and the accumulation of sediment in the Lagoon. The minimum protective target would be to reduce watershed sediment loads to non-anthropogenic levels and return the Lagoon to non-anthropogenic conditions with consideration given to background loading and other factors that also lend to impairment of beneficial uses. The numeric targets are calculated upon the historic condition (mid-1970s) when the sediment water quality standard was once met.

A historic coverage for the Los Peñasquitos watershed was developed for this period using US Geological Survey topographic maps from the 1970s. This land-use distribution was used to calculate the watershed numeric target using the LSPC watershed model. This historic (mid-1970s) sediment load of 12,360 tons per critical wet period (211 days), or 58.6 tons per day, represents the sediment TMDL watershed numeric target.

An analysis of the vegetation types present in the Lagoon was developed for the mid-1970s using historic aerial photographs from which the Lagoon numeric target was calculated (see Linkage Analysis, Section 7). The Lagoon numeric target is expressed as an increasing trend in the total area of tidal saltmarsh and non-tidal saltmarsh toward 346 acres. This target acreage represents 80 percent of the total acreage of tidal and non-tidal saltmarsh present in 1973.

Sources and Responsible Parties

Sources of sediment include erosion of canyon banks, exposed soils, bluffs, scouring stream banks, and tidal influx. Some of these processes are exacerbated by anthropogenic disturbances, such as ~~urban~~ land development within the watershed. ~~Urban~~Land development transforms the natural landscape by exposing sediment and converting pervious surfaces to impervious surfaces, which increases the volume and velocity of runoff resulting in scouring of sediment, primarily below storm water outfalls that discharge into canyon areas. Sediment loads are transported downstream to the Lagoon during storm events causing deposits on the salt flats and in Lagoon channels. These sediment deposits have gradually built-up over the years due to increased sediment loading and inadequate flushing, which directly and indirectly affects Lagoon functions and salt marsh characteristics.

There are two broad categories of sediment sources to the Lagoon: 1) watershed sources, and 2) the Pacific Ocean. The watershed sources consist of all point and non-point sources of sediment in the watershed area draining to Los Peñasquitos Lagoon. The total sediment contribution from all watershed sources is presented as the total wasteload allocation (WLA). The sediment contributions from the Pacific Ocean are considered a background source and are presented as the Load Allocation (LA). Hence, the responsible parties were assigned the total WLA and are jointly responsible for meeting the wasteload reductions required in this TMDL project. Responsible parties include the following: Phase I Municipal Separate Storm Sewer Systems (MS4s) copermittees (the County of San Diego, City of San Diego, City of Del Mar, and City of Poway), Phase II MS4s permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

Linkage Analysis

Reducing watershed sediment loads from the year 2000 levels to historic levels is a necessary component for restoring and providing long-term protection of the Lagoon's beneficial uses. Deposition of watershed sediment contributes to elevation increases within the Lagoon, leading to an increase in height relative to mean sea level. Elevation is a critical variable that determines the productivity, diversity, and stability of saltmarshes. The long-term existence of the saltmarsh depends on the success of the dominant plants, such as *Sarcoconia pacifica* (also referred to as *Salicornia virginica*) and *Frankenia salina*, and their close relationship to sediment supply, sea level change, and tidal range.

Reduced sediment loading consistent with the watershed numeric target will encourage the establishment of native vegetation in degraded areas. To represent the linkage between source contributions and receiving water response, models were developed to simulate source loadings and transport of sediment into the Lagoon. The models provide an important tool to evaluate year 2000 conditions, to evaluate historic conditions, and to calculate TMDL load reductions.

The Lagoon was capable of assimilating these historic sediment loads under historic Lagoon conditions. Because the Lagoon has evolved through time and accumulated over 40 years of watershed sediment loads, it cannot be assumed that the Lagoon, in the year 2010 conditions, can assimilate the same historic sediment loads. Evaluation of the extent of vegetation types in the Lagoon provides the necessary tool to assess how the Lagoon responds to watershed sediment load reductions and to establish a target Lagoon condition under which the Lagoon can again assimilate the historic sediment loads.

TMDL, Allocations and Reductions

TMDL = 12,360 tons per year

The maximum load of sediment that Los Peñasquitos Lagoon can receive from all sources and still meet the sediment water quality objective is 12,360 tons per year.

Wasteload Allocations to Watershed = ~~2,580~~1,962 tons/year

A wasteload allocation (WLA) of ~~2,580~~1,962 tons/year was assigned to the responsible parties. Collective wasteload reductions are required of the responsible parties.

Load Allocations to Ocean = 9,780 tons/year

The ocean was assigned a load allocation (LA) of 9,780 tons/year. Because the ocean is a natural background source, load reductions are not required of the ocean.

Margin of Safety = ~~implicit 618 tons/year~~

Conservative assumptions were used in selecting the TMDL numeric targets and implementation activities to provide an implicit margin of safety. ~~An explicit margin of safety (MOS) of 5 percent accounts for model uncertainties arising from acquiring representative total suspend solid, bank erosion, and bed load transport data.~~

The TMDL results are summarized in Tables ES-1 and ES-2.

Table ES-1. TMDL summary

Source	Critical Wet Period Load (tons)	Daily Load (tons)
Watershed contribution (WLA)	~~2,580~~1,962	~~12.2~~9.3
Ocean boundary (LA)	9,780	46.4
Margin of Safety (MOS)	~~618~~ implicit	~~2.9~~ implicit
TMDL	12,360	58.6

Table ES-2. Year 2000 vs. historical loads and percent reduction

Source	Year 2000 Load (tons)	Historical (mid-1970s) Load (tons)	Load Reduction (tons)	Percent Reduction Required
Watershed contribution (WLA)	7,719	~~2,580~~1,962	5,~~139~~757	~~6~~75%
Ocean boundary (LA)	5,944	9,780	+3,836 (increase)	+39% (increase)
Total	13,663	12,360	1,303	10%

Implementation of TMDL

The responsible parties must develop a Load Reduction Plan that will establish a watershed-wide, programmatic, adaptive management approach for implementation. The plan will include a detailed description of implementation actions, as identified and planned by the responsible parties, to meet the requirements of this TMDL. All responsible parties are responsible for reducing their sediment loads to the receiving waterbody or demonstrating that their discharges are not causing exceedances of the wasteload allocation.

Monitoring Program

Monitoring is required to assess progress towards achieving the wasteload and load allocations and numeric targets. Furthermore, the monitoring program must be capable of monitoring the effectiveness of implementation actions to improve water quality and saltmarsh habitat and remediation actions to remove sediment from the Lagoon.

Compliance Schedule

Full implementation of the TMDL for sediment must be completed within 20 years from the effective date of the Basin Plan amendment. This timeline takes into consideration the planning needs of the responsible parties ~~and other stakeholders~~ to establish a Load Reduction Plan, time needed to address multiple impairments, and provides adequate time to measure temporal disparities between reductions in upland loading and the corresponding Lagoon water quality response.

1 Introduction

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is the California state agency responsible for water quality protection in the southwest portion of the state of California. It is one of nine Regional Water Boards in California, each generally separated by hydrological boundaries. Each Regional Water Board consists of nine governor-appointed members who serve four-year terms. The San Diego Water Board, under its federally designated authority, administers the Clean Water Act (CWA) within the San Diego Region. In accordance with the CWA, the San Diego Water Board has adopted the *Water Quality Control Plan for the San Diego Region (9)* (Basin Plan) that specifies water quality standards for waters in the San Diego Region and implementation measures to enforce those standards.

Section 305(b) of the CWA mandates biennial assessment of the nation's water resources to identify and list waters not meeting their water quality standards. These waters are listed in accordance with CWA section 303(d); and the list is commonly referred to as the 303(d) list. The CWA requires states to establish a priority ranking for impaired waters and to develop and implement Total Maximum Daily Loads (TMDLs) or alternatives to address the impairments. A TMDL is a written, quantitative assessment of water quality problems and contributing pollutant sources. It identifies one or more numeric targets for restoring beneficial uses based on applicable water quality standards, specifies the maximum pollutant load that can be discharged and still meet water quality standards, allocates pollutant loads among sources in the watershed, and provides a basis for taking actions needed to meet the numeric target(s) and water quality standards.

The Los Peñasquitos Lagoon (Lagoon) is currently listed on the 303(d) list for sedimentation/siltation because the narrative sediment water quality objective is not being met. Sedimentation within the Lagoon impacts numerous beneficial uses, primarily those associated with protection of native habitats that depend on tidal inundation and/or salinity levels in non-tidal soils. Sedimentation increases elevations within the Lagoon, which leads to an increase in height relative to mean sea level. Elevation is a critical variable that determines the productivity, diversity, and stability of saltmarshes. The long-term existence of the saltmarsh depends on the success of the dominant plants, such as *Sarcoconia pacifica* ~~(also referred to as *Salicornia virginica*)~~ and *Frankenia salina*, and their close relationship to sediment supply, sea level change, soil salinity, and tidal range (US EPA, 2005).

The San Diego Water Board proposes to amend its Basin Plan to incorporate a TMDL and implementation plan to address sedimentation problems adversely affecting water quality in the Lagoon. This TMDL Staff Report describes the scientific and technical basis for confirming sediment impacts, developing numeric targets, determining sediment sources, and establishing wasteload and load allocations. Compliance with the TMDL will be assessed by monitoring the Lagoon and contributing watershed.

For the technical portion of this TMDL, the San Diego Water Board relied on the report prepared by Tetra Tech entitled, *Los Peñasquitos Lagoon Sediment/Siltation TMDL* (Technical Support Document, Attachment 1).

2 Problem Statement

Under section 303(d) of the Clean Water Act (CWA), states are required to identify waters whose beneficial uses have been impaired due to specific constituents. Los Peñasquitos Lagoon was placed on the Section 303(d) list of Water Quality Limited Segments in 1996 for sedimentation and siltation with an estimated 469 acres affected. The Lagoon is subject to the development of a total maximum daily load (TMDL) (US EPA, 2009).

The Lagoon is an estuarine system that is part of the Torrey Pines State Natural Reserve. In addition to its marine influence, the Lagoon receives freshwater inputs from an approximately 60,000-acre watershed comprised of three major canyons (Carroll Canyon, Los Peñasquitos Canyon, and Carmel Canyon). Given the status of "Natural Preserve" by the California State Parks, the Lagoon is one of the few remaining native saltmarsh lagoons in southern California, providing a home to several endangered species (California State Parks, 2009). The Lagoon is ecologically diverse, supporting a variety of plant species, and provides nursery grounds and habitat for numerous bird, fish, and small mammal populations. The Lagoon also serves as a stopover for the Pacific Flyway, offering migratory birds a safe place to rest and feed, as well as providing refuge for coastal marine species that use the Lagoon to feed and hide from predators.

The San Diego Basin Plan states, "The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses." Beneficial uses listed in the Basin Plan for the Lagoon include contact water recreation; non-contact water recreation (although access is not permitted in most areas per California State Parks); preservation of biological habitats of special significance; estuarine habitat; wildlife habitat; rare, threatened or endangered species; marine habitat; migration of aquatic organisms; spawning, reproduction and/or early development; and shellfish harvesting. The beneficial uses that are most sensitive to increased sedimentation are estuarine habitat and preservation of biological habitats of special significance. Estuarine uses may include preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (such as marine mammals or shorebirds).

Impacts associated with increased and rapid sedimentation include: reduced tidal mixing within Lagoon channels, degraded and (in some cases) net loss of saltmarsh vegetation, increased vulnerability to flooding for surrounding urban and industrial developments, increased turbidity associated with siltation in Lagoon channels, and constricted wildlife corridors.

The Los Peñasquitos Lagoon Enhancement Plan and Program (1985), San Diego Basin Plan (1994), and Clean Water Act section 303(d) highlight sedimentation as a significant impact associated with urban development and a leading cause in the rapid loss of saltmarsh habitat in the Lagoon. Sediment reduction is a management priority.

The Lagoon's 565 acres include 262 acres of tidal saltmarsh (including salt panne, tidal channels, and mudflats) and non-tidal saltmarsh and 132 acres of freshwater marsh, herbaceous wetland, and woody riparian (for example southern willow scrub and mulefat scrub) habitats. The remaining 171 acres of saltmarsh and brackish marsh vegetation are impaired by excessive sedimentation, which converted the coastal saltmarsh to *Lolium* perenne infested non-tidal saltmarsh, freshwater marsh, and woody riparian habitats (California State Parks, 2011). The environmental processes that support wetland habitats in the Lagoon have been altered by urban development in three ways:

1) Increase in the volume and frequency of freshwater input,
2) Increase in sediment deposition, and
3) Decrease in the tidal prism.

These factors have led to decreases in tidal and non-tidal saltmarsh habitats and increases in freshwater habitats and the abundance of non-native species.

3 Background Information

This section describes the Los Peñasquitos watershed and Lagoon and provides background information on the impairment.

3.1 Los Peñasquitos Watershed Description

The Los Peñasquitos watershed is located in central San Diego County (Figure 1). Both the watershed and Lagoon are included in the Peñasquitos Hydrologic Unit (HU 906). In addition to the Los Peñasquitos watershed, the Peñasquitos HU includes Mission Bay and other coastal tributaries. The Los Peñasquitos watershed is 93 square miles (approximately 60,000 acres) and includes portions of the City of San Diego, City of Poway, City of Del Mar, and San Diego County (Figure 2). There are also several major road corridors and a railway within the watershed.

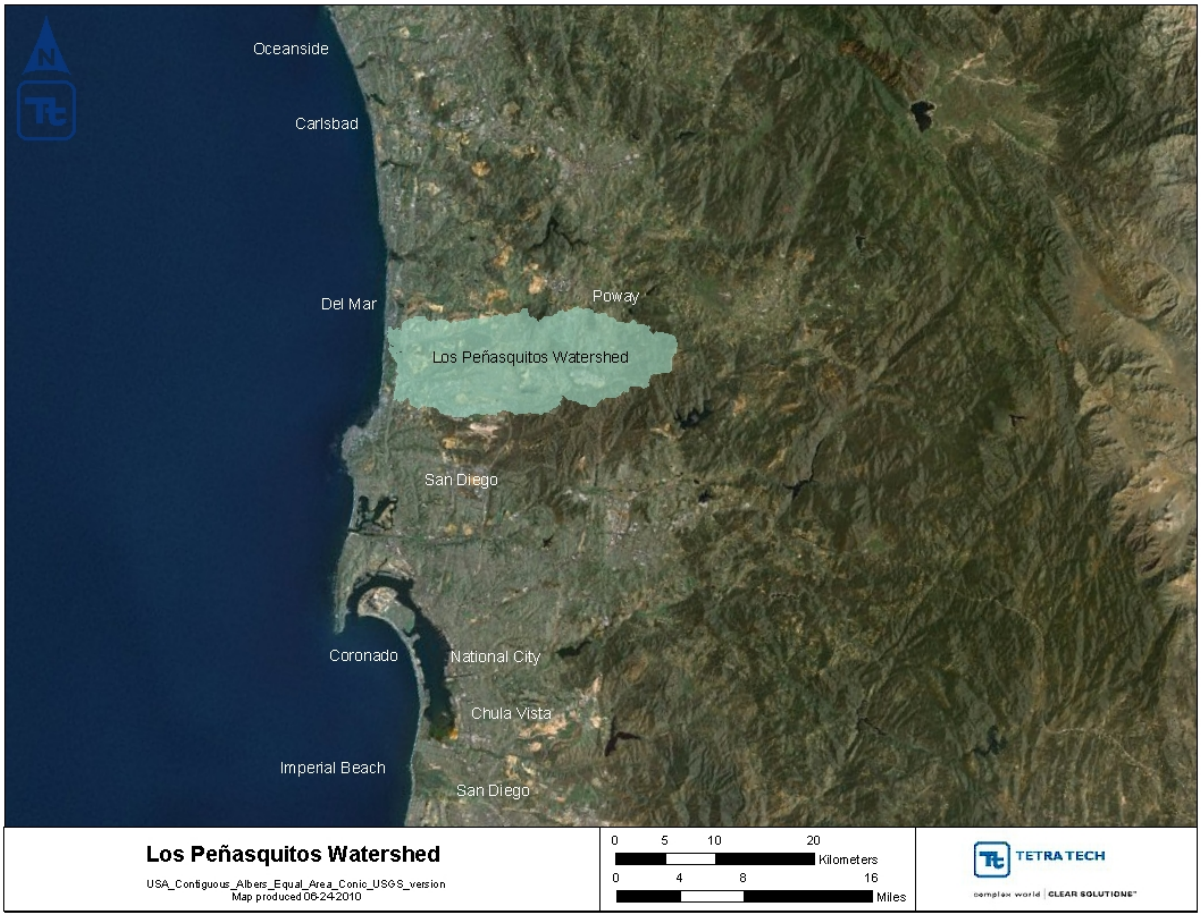

Figure 1. Location of the Los Peñasquitos watershed.

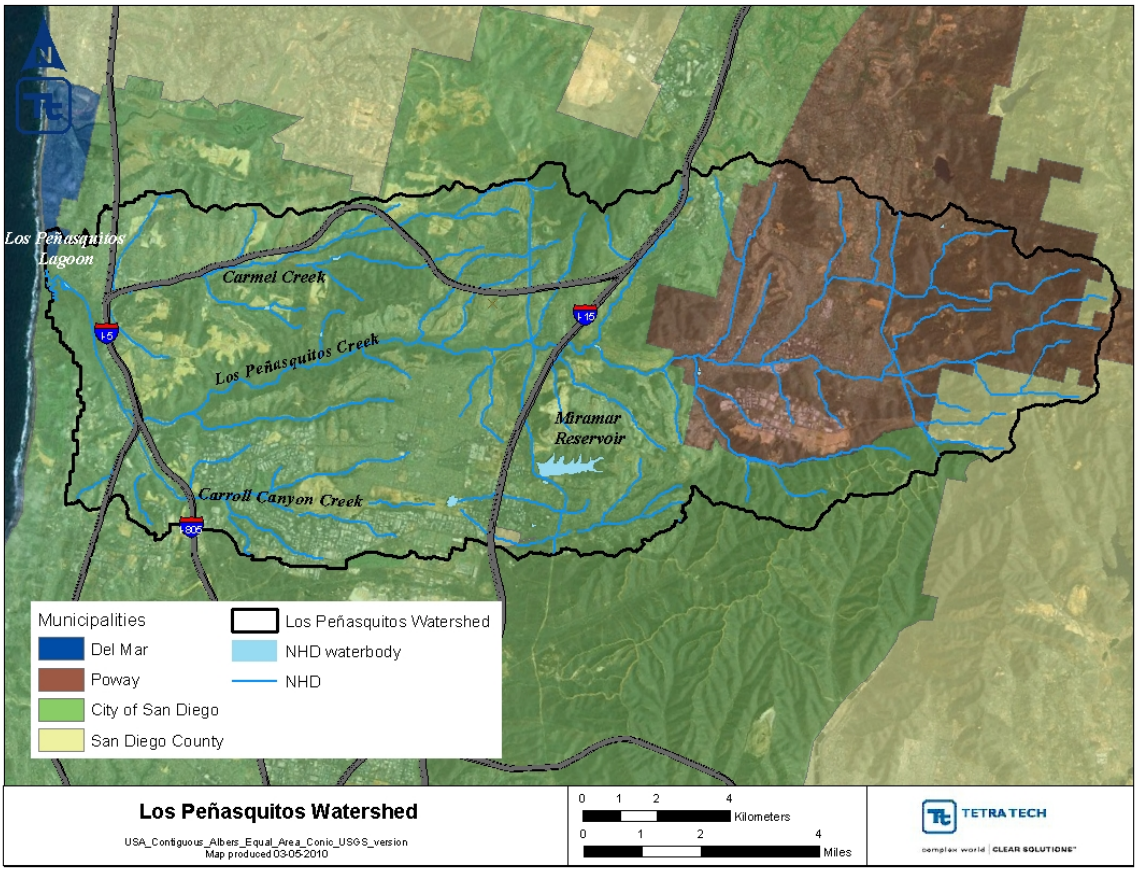

Figure 2. Municipalities and major roads within the Los Peñasquitos watershed.

The climate in the Los Peñasquitos watershed is like that of the entire San Diego Region, which is generally mild with annual temperatures averaging around 65°F near the coastal areas. Average annual rainfall ranges from nine to eleven inches along the coast. There are three distinct seasons in the San Diego Region. The summer dry season occurs from late April to mid-October. The winter season occurs from mid-October through early April and has two types of weather: 1) winter dry weather, and 2) wet weather. The winter wet weather season accounts for 85 to 90 percent of the annual rainfall.

Three major streams drain the watershed and flow into the Lagoon (Figure 2). Los Peñasquitos Creek is the largest catchment draining 59 square miles (approximately 37,760 acres) in the central portion of the watershed. Carroll Canyon Creek is the second largest catchment draining 18 square miles (approximately 11,520 acres) in the southern portion of the watershed. Carmel Creek is the smallest of the three catchments draining the remaining 16 square miles (approximately 10,240 acres) in the northern, coastal area. Los Peñasquitos Creek and Carroll Canyon Creek converge prior to entering the Lagoon. Miramar Reservoir drains 1 square mile (approximately 640 acres) of the Carroll Canyon Creek watershed. Miramar Reservoir retains imported drinking water and does not discharge downstream. Watershed elevation rises from sea level to 2,600 feet in the headwaters.

3.2 Los Peñasquitos Land Use and Population

Development within the Lagoon during the late 1800s and early 1900s altered Lagoon hydrology and set the stage for the Lagoon's vulnerability to impacts associated with intense development of the watershed that began in the mid-1970s. In 1888 a railway was constructed across the Lagoon on an elevated earthen berm just west of the current alignment of Sorrento Valley Road. This railway alignment was later abandoned and replaced in 1924. The new alignment of the railway line was placed on an elevated earthen berm that bisects the Lagoon, effectively cutting off several of the Lagoon's historic tidal channels. Both railway berms obstructed storm water flows from the watershed and facilitated sediment deposition in the southeastern portion of the Lagoon. Realignment of historic Highway 101 in the 1930s also modified the Lagoon's hydrology by realigning and fixing the ocean inlet under the southern bridge resulting in more frequent inlet closures.

In 1966 the upper Los Peñasquitos subwatershed was 9 percent urbanized (White and Greer, 2002); however, by 1975, the watershed experienced significant urbanization with agricultural areas being converted to urban uses, specifically in the Poway and Mira Mesa areas (City of San Diego, 2005). From 1966 to 1999, the acreage of urbanized land within the upper Los Peñasquitos Creek watershed increased by 290 percent (White and Greer, 2002), and by 2000, ~~the~~ 54 percent of the Los Peñasquitos watershed was developed. Additional highway infrastructure was built in and around the Los Peñasquitos watershed to accommodate the increasing population growth. Realignment of Sorrento Valley Road (ca. 1966), Carmel Valley Road (1983), segments of the I-5 freeway (1994), and the State Route 56 overpass (1995) impacted the surrounding watershed.

To decrease impacts from road infrastructure, Sorrento Valley Road was converted to a bike path in 2003 and a new U.S. Highway 101 bridge was constructed over the Lagoon mouth in August 2005. To mitigate for impacts from State Route 56 and several other projects for the City of San Diego, the 27-acre El Cuervo Norte wetlands restoration project was created in the Peñasquitos Canyon Preserve. The El Cuervo Norte wetlands were designed to provide over 24 acres of southern willow scrub, oak-sycamore woodland and freshwater marsh habitat. The project consisted of approximately 9 acres of wetland creation, 14.3 acres of wetlands enhancement, 2 acres of upland native buffer, and 1.3 acres of park access road and a San Diego Gas & Electric power pole maintenance area (Dudek, 2010).

Land use associated with the mid-1970s time period is illustrated in Figure 3. Land-use/land cover data for the Los Peñasquitos watershed were not available for this period, therefore, a historical coverage was developed based on the location and type of structures that are shown in USGS topographic maps from the 1970s (primarily the La Jolla quadrangle – dated 1975).

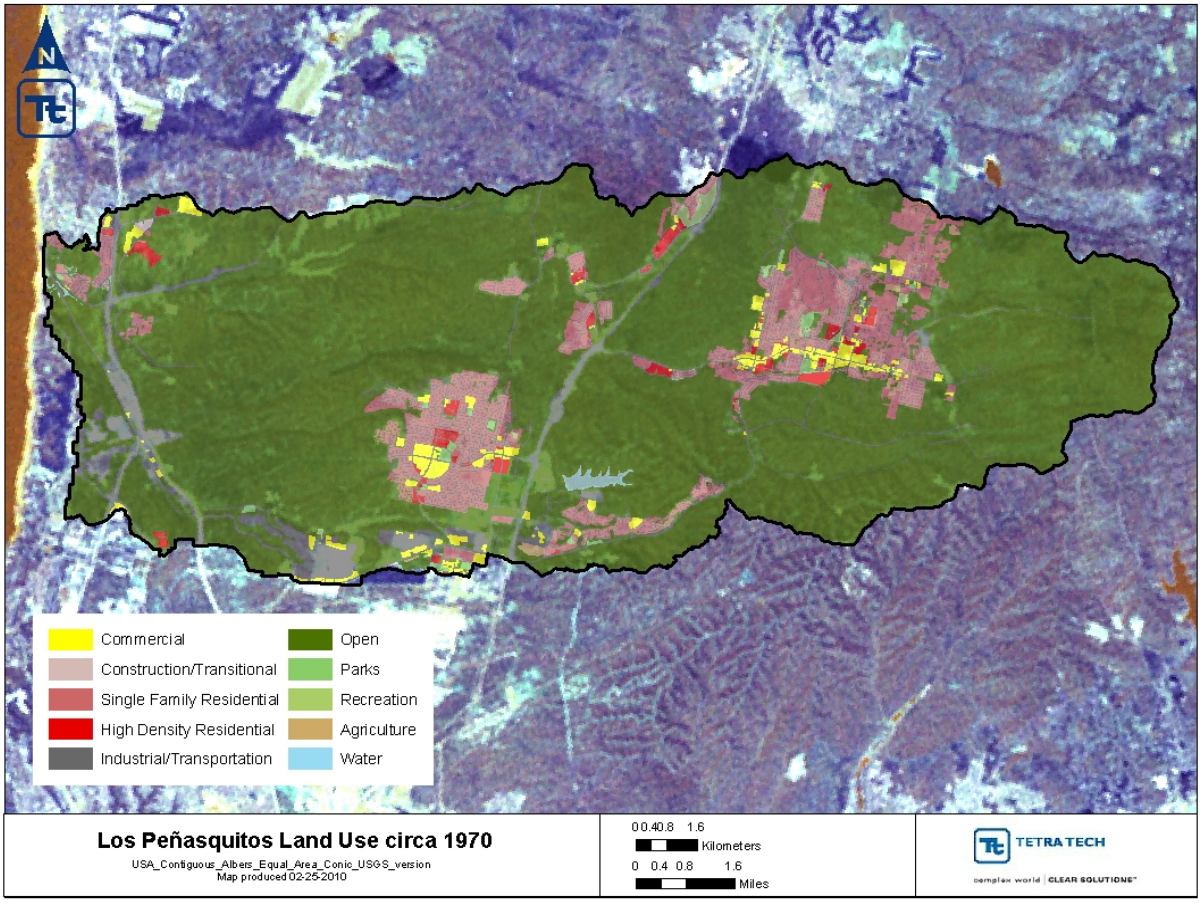

Figure 3. Historic land use in the Los Peñasquitos watershed (1970s).

Data detailing land use in the Los Peñasquitos watershed is available through the San Diego Association of Governments 2000 land-use coverage and is presented in Figure 4. Approximately 54 percent of the watershed has been developed, with 46 percent of that area classified as impervious. The largest single land-use type in the Los Peñasquitos watershed is open space (approximately 25,500 acres), followed by low density residential development (approximately 14,250 acres) and industrial/transportation (approximately 11,660 acres). Land use differences between the year 2000 and the historical time period are shown in Table 1.

To further characterize the land use changes, population trends are illustrated in Figure 5. Figure 5 depicts the expansive population growth from 1970 to 2010 in the San Diego region facilitated by intense development throughout the region.

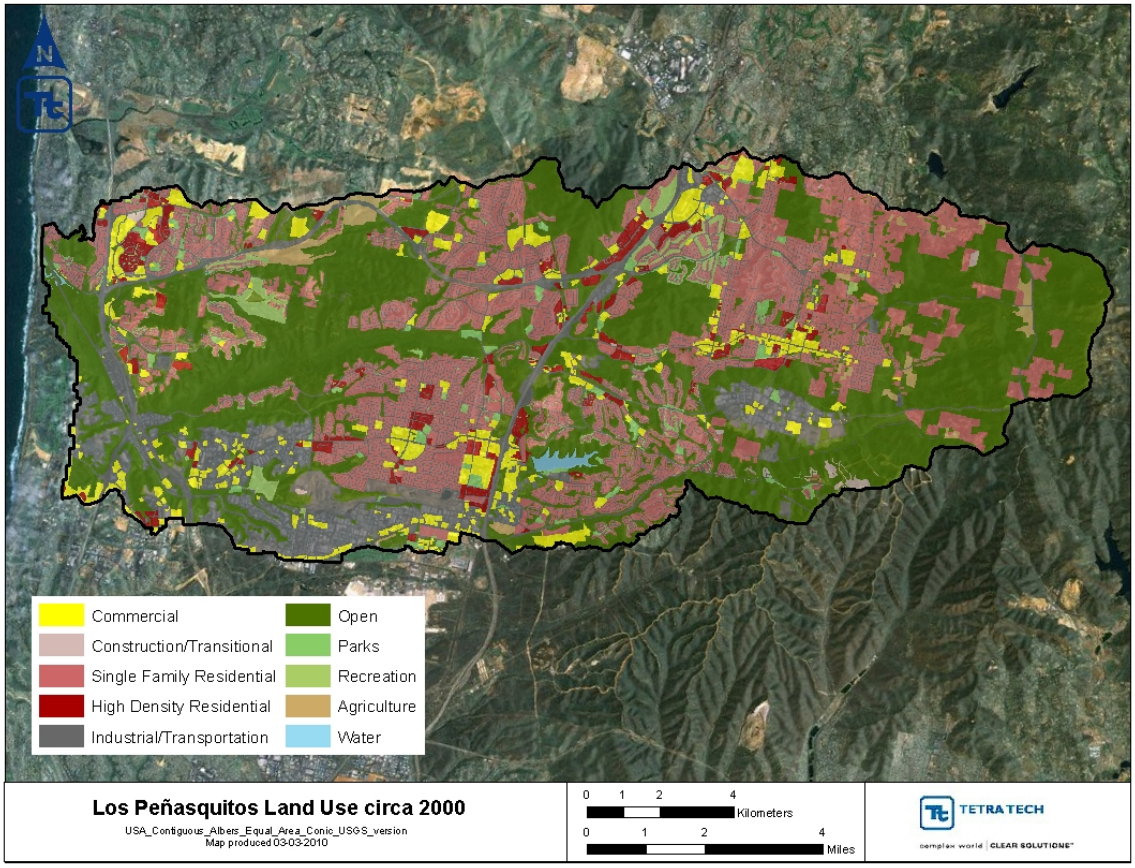

Figure 4. Year 2000 land uses in the Los Peñasquitos watershed.

Table 1. Year 2000 (SANDAG 2000) vs. historical land use comparison

Land Use	Year 2000 area (ac)	Year 2000 percent of total area	Historic, mid-1970s area (ac)	Historic, mid-1970s percent of total area	Percent change of total watershed area
Agriculture	741	1.24%	100	0.17%	1.07 %
Commercial	3,591	6.00%	1,088	1.82%	4.18%
Construction/ Transitional	169	0.28%	23	0.04%	0.24%
High Density Residential	1,840	3.07%	648	1.08%	1.99%
Industrial/ Transportation	11,654	19.46%	4,830	8.07%	11.40%
Open	25,463	42.52%	47,445	79.23%	-36.71%
Parks	1,326	2.22%	2,884	0.48%	1.73%
Recreation	670	1.12%	139	0.23%	0.89%
Single Family Residential	14,258	23.81%	5,155	8.61%	15.20%
Water	161	0.27%	160	0.27%	0.00%
Total	59,879	100.00%	59,879	100.00%	

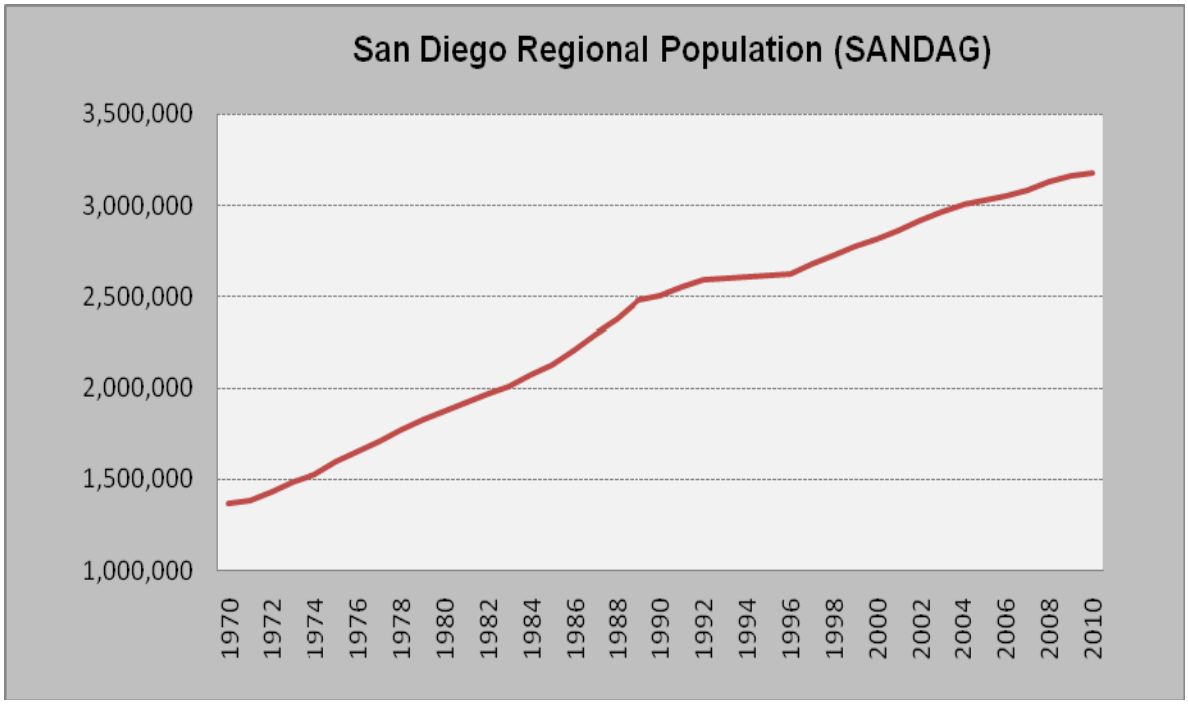

Figure 5. San Diego regional population trends (SANDAG, 2010).

3.3 Los Peñasquitos Lagoon Description

The Lagoon was formed many thousands of years ago when rising sea levels flooded the Peñasquitos Valley to form a deep marine embayment. Over the years, inflowing creeks deposited alluvial sediment, which gradually filled the embayment to form the small estuarine system seen today (Mudie et al.~~,~~ 1974). The Lagoon is in a dynamic state with continual influences from the tide and upstream runoff (Greer and Stowe, 2003). The Lagoon resides in Torrey Pines State Natural Reserve and is one of the few remaining native saltmarsh lagoons in southern California, thereby given the status of "Natural Preserve" by the California State Parks (Figure 6).

Figure 6. Photograph of Los Peñasquitos Lagoon. Tidal flows enter the Lagoon via a channel beneath the U.S. Highway 101 bridge and then bifurcate into the eastern and western branches.

The Lagoon is ecologically diverse, supporting a variety of plant species and providing habitat for numerous bird, fish, and small mammal populations. The saltmarsh daisy, San Diego sagewort, and coast wallflower reside in the Lagoon (LPL Foundation, 2011). The Lagoon also serves as a stopover for migratory birds and provides habitat for coastal marine and saltmarsh species. Listed bird species endemic to the Lagoon include the light-footed clapper rail (federally-listed, endangered), Belding's savannah sparrow (state-listed, endangered), California brown pelican (federally-de~~listed,~~ ~~threatened~~ on November 17, 2009), western snowy plover (federally-listed, threatened) and California gnatcatcher (federally-listed, threatened) (Mudie~~,~~ et al. 1974). The

Lagoon has also provided habitat for the federally-listed, endangered California least tern, although this species has not been observed in the Lagoon since 1980 (Cooper, 1984).

Maintaining a tidal prism and proper exchange between the ocean and the Lagoon are critical for maintaining adequate saltmarsh salinity levels. Tidal flow mainly keeps the mouth open; however, storm water flows play a role in re-establishing the thalweg in tidal channels and forcing sediment out of the inlet and back into the ocean. The role of storm water flows in performing these actions is diminished by the railway berm and by thick stands of riparian and brackish marsh habitat at the base of the Lagoon's tributaries, which impede and detain runoff flows before they can scour the inlet area.

Deposition of sediment within the Lagoon inlet is caused primarily by tides, wave run up and storm surge that push sand and cobbles from nearby beaches and offshore sources into the inlet area (LPL Foundation and State Coastal Conservancy, 1985). Grain size analysis conducted at the Lagoon inlet indicate that sediment loading from the watershed may increase the build-up rate of sand bar formation, but the primary source of sedimentation in the Lagoon's inlet area is the ocean (Elwany, 2008).

During periods when the Lagoon mouth is open, tidal flows from the Pacific Ocean enter the Los Peñasquitos Lagoon via a channel beneath the southern bridge at Torrey Pines Road, formerly referred to as Highway 101. Historical records indicate that the Lagoon was continuously connected to the ocean at least until 1888 (Mudie et al.~~,~~ 1974). Under present conditions, a permanent mouth opening to the ocean cannot be naturally maintained, except during exceptionally wet winters. This is primarily due to the loss of the inlet's ability to meander along the beach and to the reductions in velocities of storm driven outflows. The Lagoon's inlet is often mechanically dredged to alleviate the danger of flooding and to improve the health of the Lagoon.

Approximately 150 yards from the Lagoon mouth, the main Lagoon channel bifurcates (Figure 6). The eastern branch runs inland under the railroad trestle, then trends southeastward terminating in a series of small creeks that drain the few remaining salt flats and non-tidal marsh on the southeastern side of the Lagoon. The eastern branch receives flow from Carmel Creek (Figure 7). The western branch of the main channel system is generally narrower and shallower than the eastern branch. It runs in a southerly direction and terminates in a dendritic pattern of creeks that drain the marsh on the southwestern side of the Lagoon. Two of these poorly defined creeks connect with the combined Los Peñasquitos and Carroll Canyon Creeks, which flow into the Lagoon through a narrow (approximately 10 feet wide) channel on the west side of the railroad berm (Figure 8).

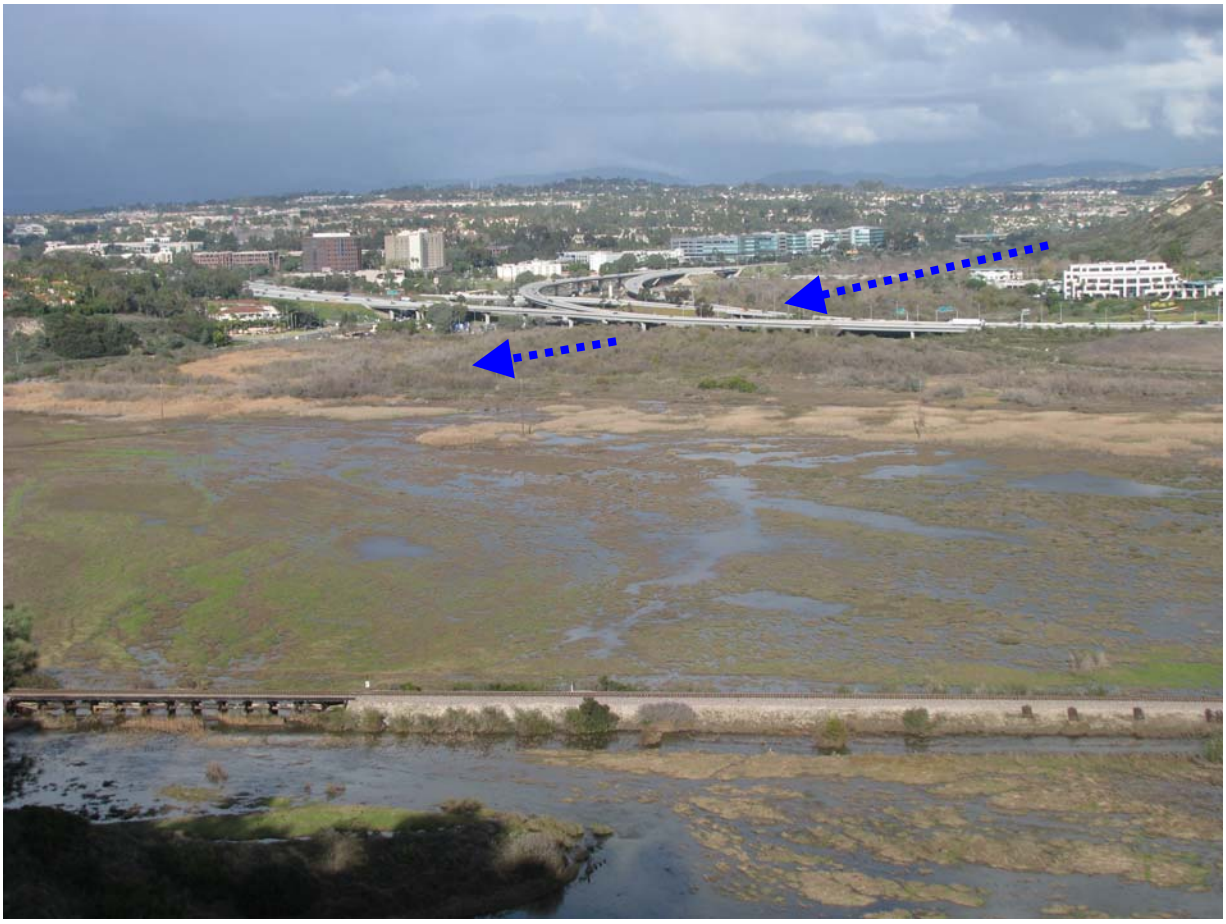

Figure 7. Photograph of Carmel Creek entering Los Peñasquitos Lagoon on January 3, 2011, shortly after a rain event. The creek flows along the dashed arrow, along SR 56 and beneath the I-5 freeway.

Figure 8. Photograph of the combined Los Peñasquitos and Carroll Canyon Creeks entering Los Peñasquitos Lagoon shortly after a rain event on January 3, 2011. The combined creeks flow along the dashed arrow, along the western side of the railroad berm.

3.4 Impairment Description

The Lagoon is listed as impaired on the 303(d) list for sedimentation/siltation. The 303(d) listing indicated that the entire Lagoon was not supporting beneficial uses and was impaired by sediment. Impacts due to sedimentation are not clearly differentiated from the impacts associated other stressors on the Lagoon such as freshwater inputs and physical barriers within the Lagoon.

3.4.1 Urbanization Impacts

Urbanization of the watershed has directly affected the natural drainage, pollutant loads, and hydrologic characteristics of the watershed (City of San Diego, 2005). The volume, velocity, duration, and timing of runoff events changes as the landscape changes from pervious to impervious. Recent research has shown that impervious surface is a useful metric to represent the imprint of land development on the landscape because it is directly related to runoff (Burton and Pitt, 2002; Scheuler, 1994). Land development typically results in increased runoff and erosion rates; accounting for up to 50 percent of sediment loads in urban areas (Burton and Pitt, 2002).

Impervious cover has been identified as the 'unifying theme' in stream degradation (US EPA, 1999); with stream degradation occurring with as little as ten percent imperviousness of the watershed (Scheuler, 1994). The effects of impervious surfaces on sedimentation rates in the watershed is exacerbated by the location of MS4 outfalls along or just below mesa tops that release concentrated storm flows into steep drainages with moderately to highly erosive soils (Weston 2009).

Continued sedimentation and freshwater inputs, both resulting from urbanization, have resulted in significant alterations to habitat (White and Greer, 2002; Greer and Stowe, 2003; CE, 2003; Mudie et al.~~,~~ 1974; LPL Foundation and State Coastal Conservancy, 1985). The encroachment of freshwater wetlands and reduction of saltwater marsh is evident in the National Wetland Inventory (NWI) maps from 1985 and 2009 (Figures 9 and 10). The location of different wetland types is also shown in maps that were included in the Los Peñasquitos Lagoon Enhancement Plan (1985) and in the Mudie et al. 1974 report (Figures 11 and 12). Although there are differences in the depiction of wetland areas from each study and time period, these maps show an encroachment of riparian, freshwater, and upland vegetation types in the eastern portion of the Lagoon that is likely related to sediment accumulation, year-round freshwater flows, and physical impediments to tidal flow.

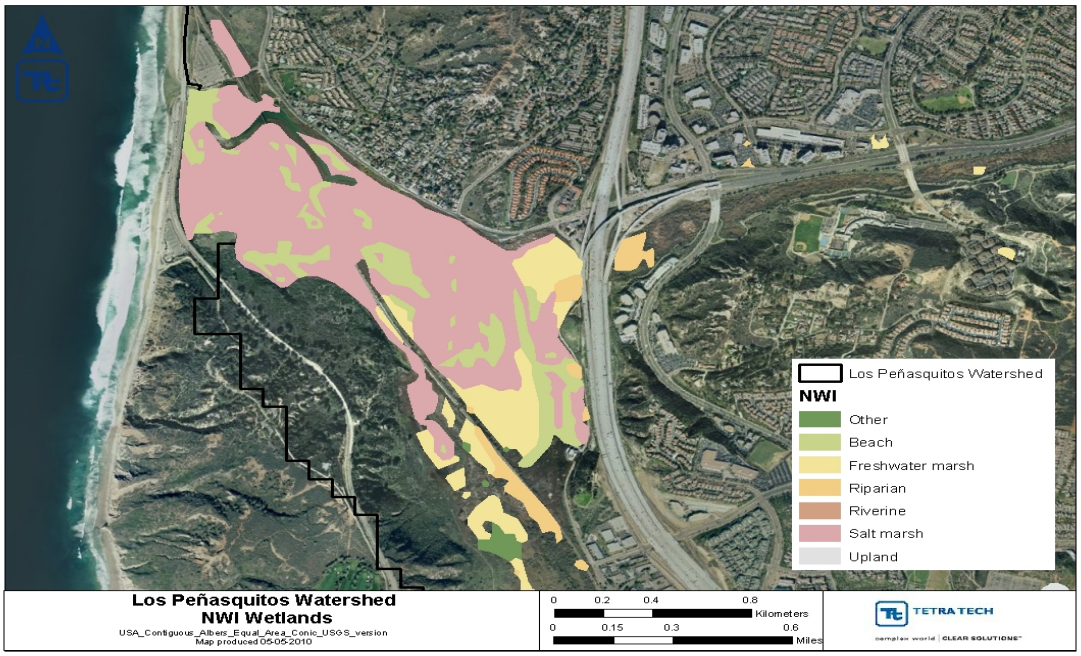

Figure 9. National Wetland Inventory (NWI) – 1985.

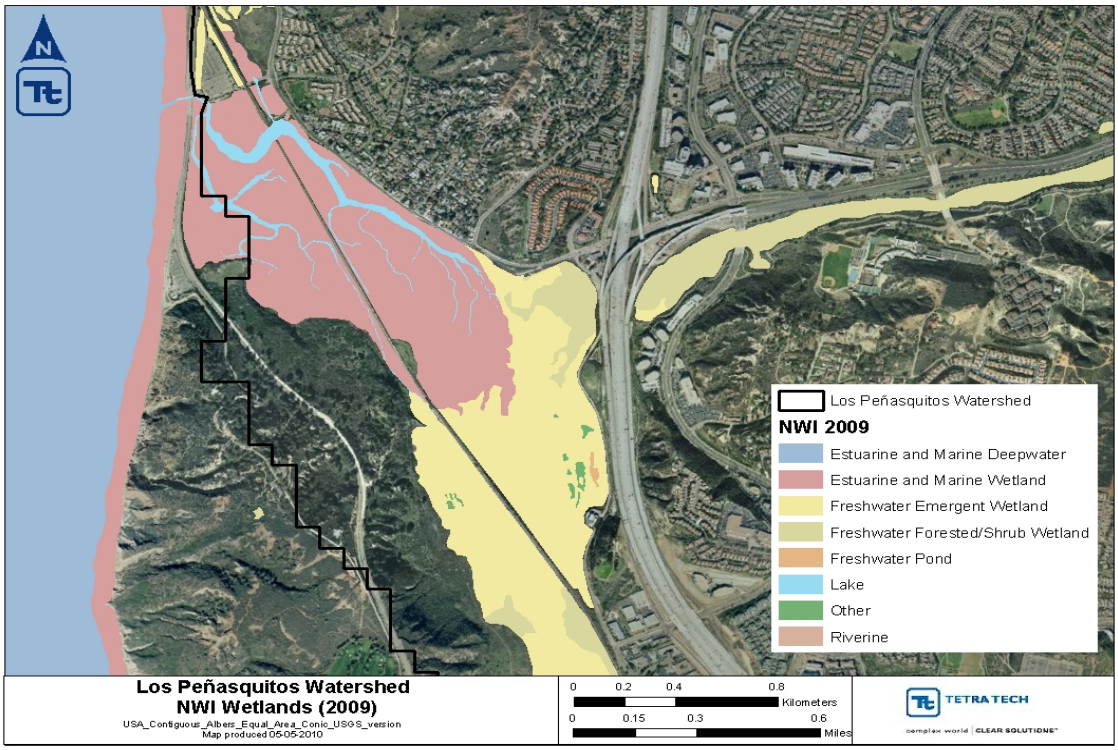

Figure 10. National Wetland Inventory (NWI) – 2009.

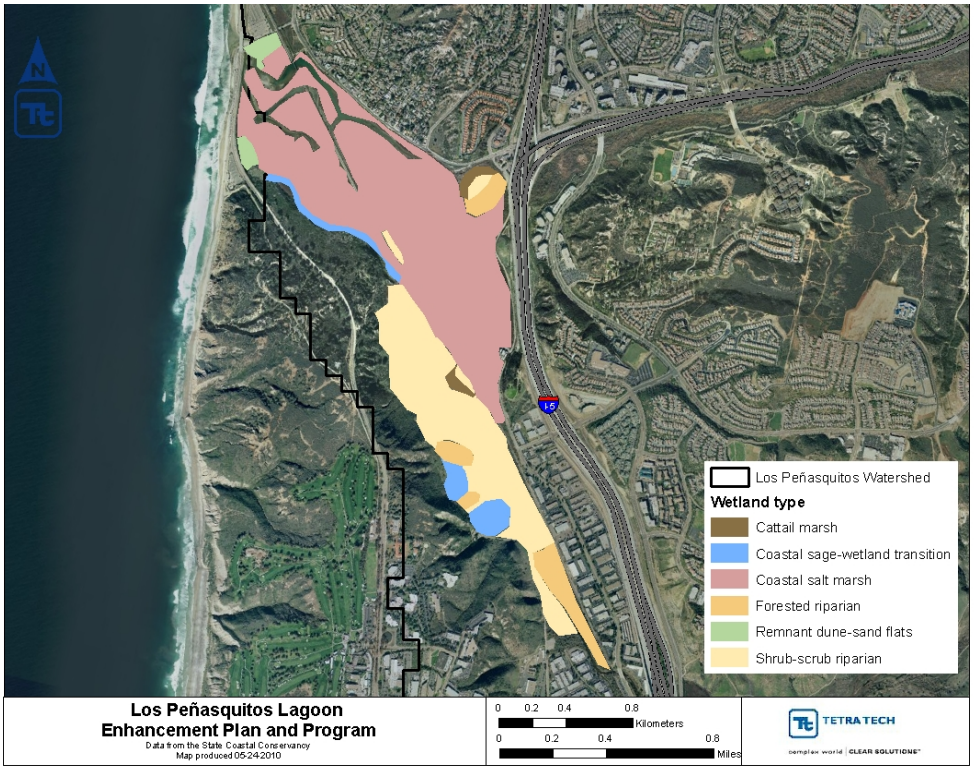

Figure 11. LPL Enhancement Plan – 1985 wetland types.

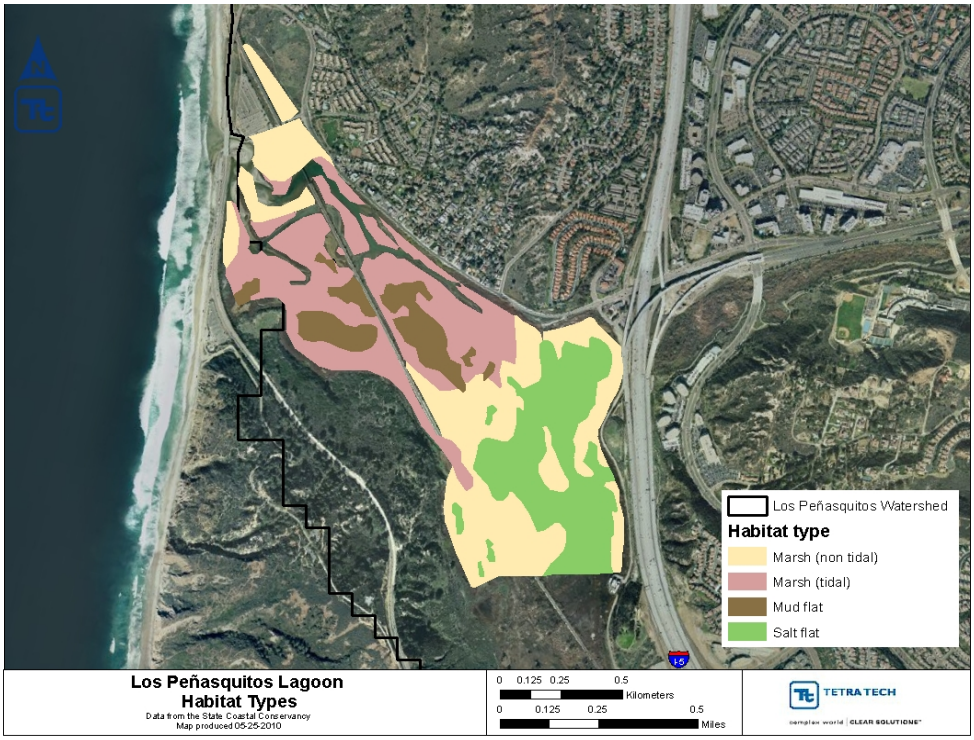

Figure 12. Historical lagoon wetland types (Mudie et al. 1974).

3.4.2 Sedimentation Impacts

Increased and rapid sedimentation results in reduced tidal mixing within Lagoon channels, degraded and net loss of saltmarsh vegetation, increased vulnerability to flooding for surrounding urban and industrial developments, increased turbidity associated with siltation in Lagoon channels, and constricted wildlife corridors. Specifically, deposition of watershed sediment contributes to elevation increases within the Lagoon, leading to an increase in height relative to mean sea level. Elevation is a critical variable that determines the productivity, diversity, and stability of saltmarshes. The long-term existence of the saltmarsh depends on the success of the dominant plants, such as *Sarcoconia pacifica* ~~(also referred to as *Salicornia virginica*)~~ and *Frankenia salina*, and their close relationship to sediment supply, sea level change, soil salinity, and tidal range (US EPA, 2005). While these species can tolerate low salinity levels, year round inundation of freshwater and/or decreases in soil salinity prevent the ability of saltmarsh plants from outcompeting transitional or brackish marsh plant species.

Several studies have documented the influx of sediment originating in the watershed to the Lagoon. In 1985, the Los Peñasquitos Lagoon Enhancement Plan estimated that sedimentation had removed 25 acres from the coastal saltmarsh inventory. Mudie and Byrne (1980) estimate that sedimentation rates have increased to 50 cm/century since European settlement of the area. This increase in sedimentation was supported by an article published in 2000 by Cole and Wahl that examined a 3,600-year sediment core take from the Lagoon (Cole, 2000). In 1978 a coastal commission report concluded that unmitigated urbanization could double the annual sediment load within 30 years (Prestegaard, 1978). The main depositional areas in the Lagoon are just downstream of the I-5 Carmel Creek culverts and at the southern end of the Lagoon near Sorrento Valley. Gradual sediment accumulation in the Lagoon results in areas of higher elevation, which tidal water no longer reaches. Between 1968 and 1985, sediment from Carmel Valley had raised the elevation of the northeast corner of the Lagoon by 6.1 feet, which has resulted in the conversion of saltmarsh vegetation into riparian and cattail marsh (LPL Foundation and State Coastal Conservancy, 1985). The formation of cattail marsh promotes sediment retention, further exacerbating sedimentation impacts.

There are many potential sources that have influenced the accumulation of sediment within the Lagoon. Sources include erosion of canyon banks and bluffs, scouring stream banks, exposed soils, and tidal influx. Some of these processes are exacerbated by anthropogenic disturbances, such as land~~urban~~ development within the watershed. ~~Urban~~Land development transforms the natural landscape and results in increased runoff resulting in scouring of sediment, primarily in open space areas located below storm water outfalls that discharge into steep canyons just below the mesa top.

Sediment loads are transported downstream to the Lagoon during storm events causing deposits on the salt flats and in Lagoon channels. These sediment deposits have gradually built-up over time~~the years~~ due to increased sediment loading and inadequate flushing, which directly and indirectly affects lagoon functions and saltmarsh characteristics.

Legacy sediments from construction activities within the Lagoon (e.g. construction of the railway berms, construction and operation of the sewage treatment plant, and construction and operation of access roads) also play a role in the Lagoon's sedimentation impairment.

3.4.3 Freshwater Impacts

Freshwater runoff from adjacent and upstream urban development reduces soil salinity, allowing brackish and freshwater plant species to encroach into the saltmarsh habitat (CE, 2003). White and Greer (2002) hypothesize that hydrology and soil salinity are significant drivers to maintain the distribution and abundance of Lagoon's native saltmarsh vegetation types and, ultimately, the associated biological communities.

Most of the freshwater input into the Lagoon flows through Los Peñasquitos Canyon. Carroll Canyon Creek to the south and Carmel Creek to the north also contribute freshwater to the Lagoon. Historically, Los Peñasquitos Creek was the only tributary that flowed year-round, but only during years of above average precipitation. Carroll Canyon and Carmel Creeks only flowed during significant rainfall events and then reverted back to dry washes or creekbeds. Beginning in the 1990s, Carroll Canyon and Carmel Creeks began flowing year-round due to increased urban development within the watershed. Year-round freshwater flows attribute to habitat conversion, which results in sediment related impacts as newly established riparian and brackish marsh plant species serve as sediment traps during low to medium storm flows.

A 1974 report by the California Department of Fish and Game expressed concerns associated with a significant increase in the flow of urban runoff draining into the Lagoon's eastern channel. This report concluded that increased runoff was the result of intensive residential development of the mesas northeast of the Lagoon. During the fall of 1973, this runoff volume amounted to approximately 1,500 gallons per day (Mudie et al.,1974).

Previous studies that focused on the Lagoon and the surrounding watershed provide additional information on historical conditions and hydrologic changes associated with urbanization. For example, White and Greer (2002) classified three distinct periods of urbanization within the upper Los Peñasquitos Creek watershed: 1965-1973 was classified as low urbanization (<15 percent), 1973-1987 as moderate urbanization (15-25 percent), and 1988-2000 as high urbanization (>25 percent). Across the entire time period, the 1-2 year flood interval increased from 229 cubic feet per second (cfs) to 745 cfs to 1,272 cfs in each respective period. Flow duration curves indicate increased baseflow, such as discharges above 1.7 cfs occurred more often during the period between 1973 to 1987 than the earlier period (White and Greer, 2002). This study also estimated a four percent increase in runoff since 1972, with an increase in minimum flows throughout the study equivalent to 17 percent per year. These findings are supported by a recent review of flow data in Los Peñasquitos Creek (Figure 13), which demonstrates a steady increase in monthly mean flows since the 1970s.

The above analyses illustrate the general urbanization trends throughout the watershed that impact the Lagoon. The analyses also assist with identifying a period in time when increased sediment delivery from development was not the primary concern for the Lagoon's ecological functions.

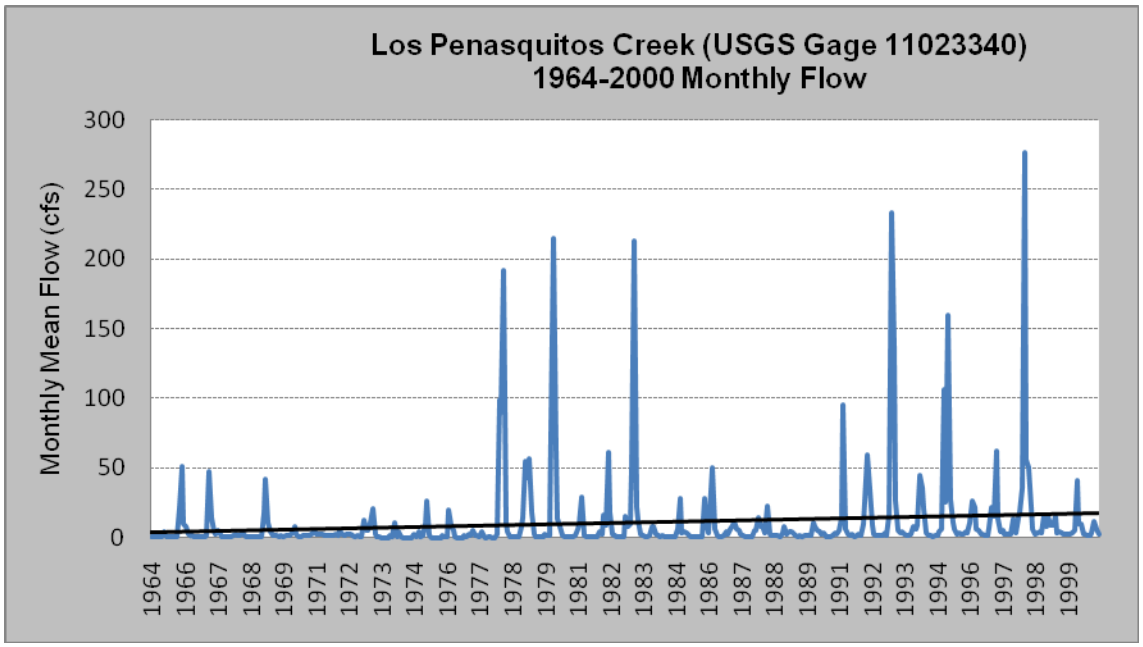

Figure 13. Hydrograph for Los Peñasquitos Creek.

3.4.4 Physical Impacts

As the region began to develop, urban infrastructure, including construction of the railroad (1880s-1925), altered the natural drainage and restricted tidal flows within the Lagoon. The original railroad was built along the eastern edge of the Lagoon (present Carmel Valley Road) and southwards across the salt flats. Construction of the Santa Fe Railroad (presently Burlington Northern Santa Fe Railroad) in 1925 moved the railway to the center of the Lagoon and cutoff several of its natural tidal channels by creating a barrier between the eastern and western portions of the Lagoon. Three railroad trestles provide the only connection between the eastern and western portions of the Lagoon. Later, the construction of Highway 101 (now referred to as Torrey Pines Road) in 1932 relocated the Lagoon's historic ocean inlet and confined the inlet to a single, narrow location under the lower bridge, which resulted in reduction of the Lagoon's tidal prism and exchange between the ocean and Lagoon (Mudie et al.~~,~~ 1974).

The North Beach Parking Lot was constructed in 1968 by State Parks in historically tidal areas that further influenced hydrologic exchanges (LPL Foundation and the State Coastal Conservancy, 1985).

3.4.5 Wastewater Treatment Plant Impacts

In response to increasing urban development within the watershed, two wastewater treatment plants operated from 1962-1972 and discharged effluent to the Lagoon and tributaries that ultimately reach the Lagoon. Although these facilities elevated minimum and median annual discharge values and assisted with maintaining the tidal prism, the effluent caused insect and odor problems (Mudie et. al.~~,~~ 1974), elevated nutrients (Bradshaw and Mudie, 1972), and depressed salinity concentrations (Torrey Pines State Natural Reserve, 2009). These problems continued until 1972 when surrounding areas were all connected to the San Diego Metropolitan sewer system. However, pump station failures have resulted in numerous sewage spills into the Lagoon. The most recent spill from Pump Station 64 occurred on September 9, 2011, during which over 1.9 million gallons of untreated sewage was discharged just upstream of the Lagoon. Impacts to water quality and aquatic species were recorded upstream and within the Lagoon's channels, as well as along local beaches outside of the lagoon inlet.

4 Numeric Targets

When calculating TMDLs, numeric targets are selected to result in attainment of the water quality standard. The numeric target is a measurable value for the pollutant of concern that, if achieved, will meet the water quality objectives (WQOs) for a waterbody and subsequently ensure the restoration and/or protection of beneficial uses. Achievement of the water quality standard for sediment in the Lagoon was interpreted using multiple lines of evidence to determine the numeric target for this TMDL.

4.1 Applicable Water Quality Standards

The narrative sediment WQO, as set forth in the Basin Plan states, "The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses" (San Diego Water Board, 1994).

The Basin Plan identifies the beneficial uses that are designated for Los Peñasquitos Lagoon (Table 2) (San Diego Water Board, 1994). Compliance with WQOs must be assessed and maintained throughout the waterbody to protect all beneficial uses. While the estuarine (EST) and preservation of biological habitats of special significance (BIOL) beneficial uses are the most sensitive to increased sedimentation, the narrative sediment WQO is applied to all beneficial uses.

Table 2. Beneficial uses designated for Los Peñasquitos Lagoon

Beneficial Use	Beneficial Use Description
REC 1	Includes uses of water for recreation activities involving body contact with water, where ingestion of water is reasonable possible. These uses include, but are not limited to, swimming, wadding, water skiing, skin and SCUBA diving, surfing, white water activities, fishing, or use of natural hot springs.[1]
REC 2	Includes the use of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonable possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beach combing, camping, boating, tide pool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.[1]
BIOL	Includes uses of water that support designated area or habitats, such as established refuges, parks, sanctuaries, ecological reserves, or Areas of Special Biological Significance (ASBS), where the preservation or enhancement of natural resources requires special protection.

Beneficial Use	Beneficial Use Description
EST	Includes uses of water that support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds).
WILD	Includes uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.
RARE	Includes uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under State or federal law as rare, threatened or endangered.
MAR	Includes uses of water that support marine ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.
MIGR	Includes uses of water that support habitats necessary for migration, acclimatization between fresh and salt water, or other temporary activities by aquatic organisms, such as anadromous fish.
SPWN	Includes uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish. This use is applicable only for the protection of anadromous fish.
SHELL	Includes uses of water that support habitats suitable for the collection of filter-feeding shellfish (e.g., clams, oysters and mussels) for human consumption, commercial, or sport purposes.

1. Access to some areas is not permitted per California State Parks.

4.2 Determining the Reference Condition

The narrative sediment WQO applies to sediment loading to the Lagoon and the accumulation of sediment in the Lagoon. One protective target would be to reduce watershed sediment loads to non-anthropogenic levels to help return and maintain the Lagoon to non-anthropogenic conditions with consideration given to background loading and other factors that also lend to impairment of beneficial uses. The numeric targets are calculated upon the historic condition when water quality standards were once met.

Available literature and past accounts of sedimentation impacts within the Lagoon were reviewed in the Technical Support Document (Attachment 1). This information provides the understanding of how watershed sedimentation results in impacts to the Lagoon's beneficial uses. Furthermore, this information was used in a weight of evidence approach to select the historic period that represents a time when water quality standards were being obtained.

The timeline of significant events and literature references (Figure 14 and Figure 15) summarizes the important changes in the Lagoon over time in relation to changes in land use (urbanization in particular) and other impacts discussed in Section 3 of this TMDL.

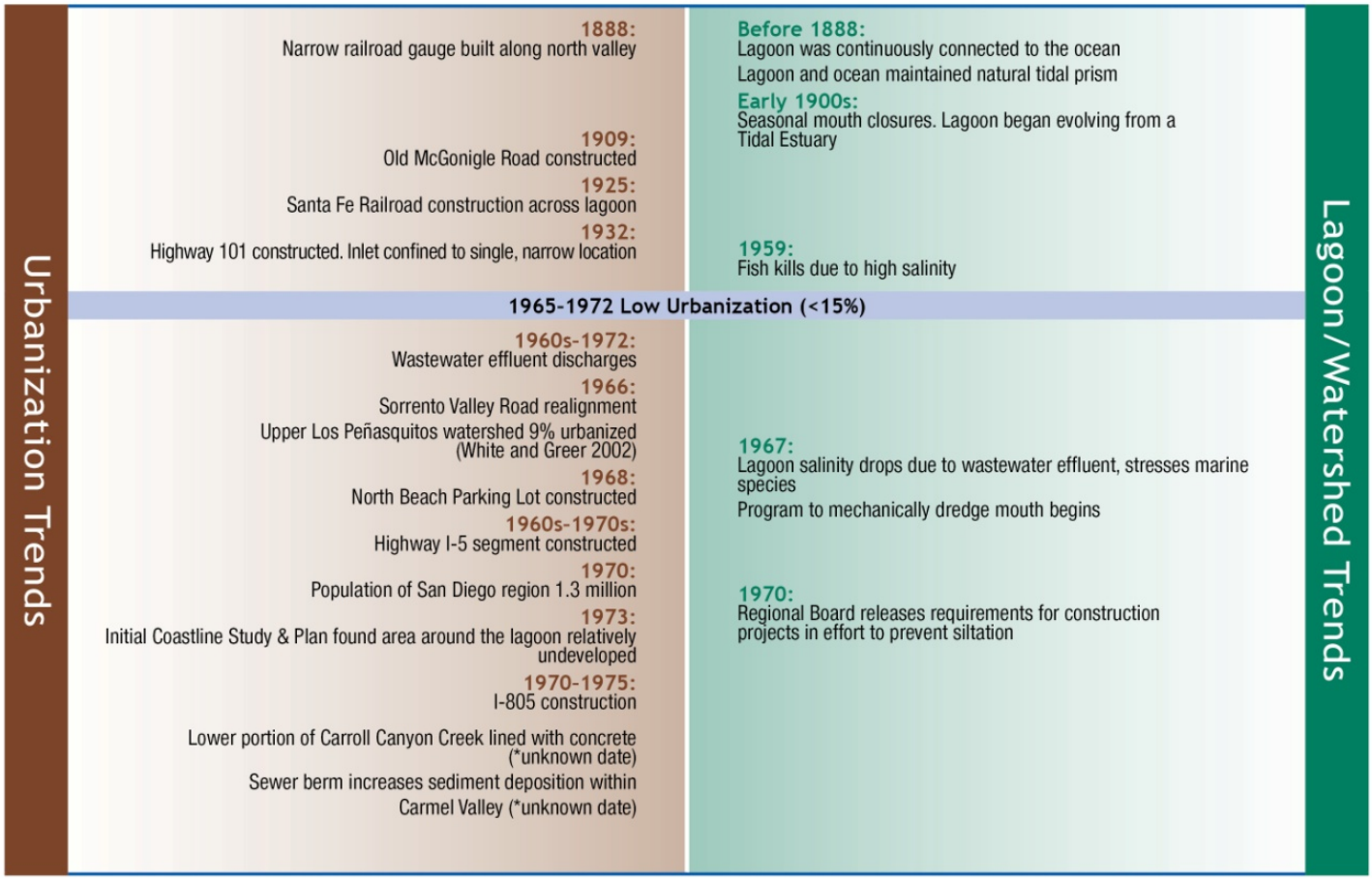

Figure 14. Timeline of urbanization and lagoon trends (1800s through early 1970s).

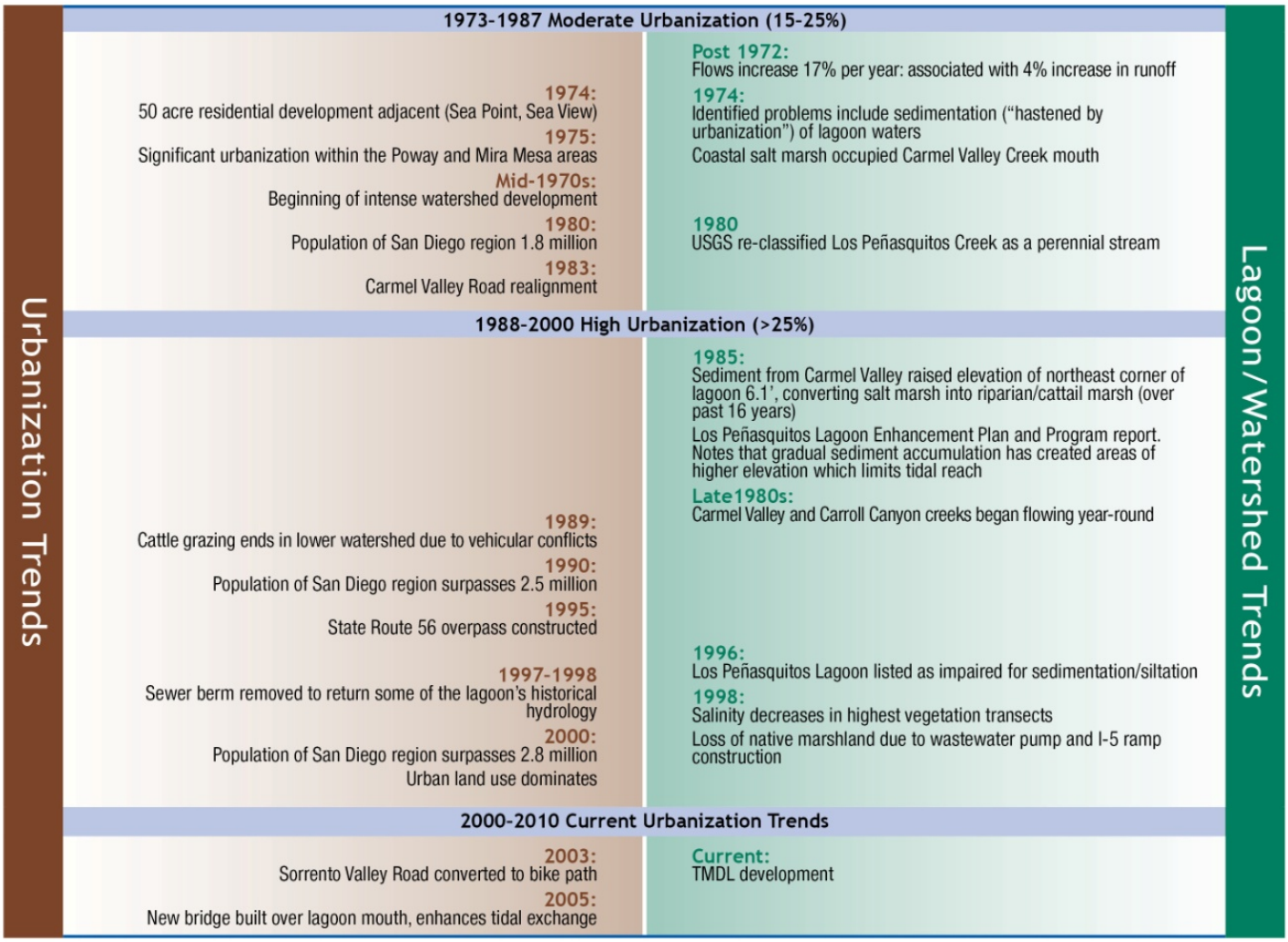

Figure 15. Timeline of urbanization and lagoon trends (mid-1970s through 2010).

Several lines of evidence were considered to determine the time period during which land-use distribution and Lagoon conditions supported water quality standards. This time period defines the reference condition upon which the numeric targets were calculated. The identified time period provides the link to the narrative sediment WQO and defines the conditions that will result in the protection of Lagoon beneficial uses from sedimentation. The lines of evidence considered include:

- **Urbanization trends**: A review of historical literature indicated that intensive development in the Los Peñasquitos watershed began in the mid-1970s. Land-use data shows a nearly 37 percent decrease in open space in the watershed beginning in the mid-1970s.
- **Population data**: Trend analysis of population data indicates that the population of the San Diego region has been steadily increasing since 1970.

- **Flow data**: Review of historical streamflow data from the US Geological Survey gage on Los Peñasquitos Creek and the conclusions drawn by White and Greer (2002) indicate that flow has increased substantially since the 1970s. White and Greer (2002) associated these flow increases with urbanization trends in the watershed.
- **Evaluation of Lagoon conditions:** As described in Section 3, Lagoon conditions have been influenced by several factors, which can be separated into watershed impacts and problems associated with the Lagoon mouth. Watershed impacts to the Lagoon include sediment delivery associated with ~~urban~~land development, which increased substantially in the mid-1970s. The wastewater treatment plants impacted water quality in the Lagoon until 1972 when the area was connected to the city sewer system, making it difficult to differentiate between the wastewater impacts and development-associated impacts during this time period (pre-1972). Available literature indicates that sediment deposition from the watershed is not adequately flushed out of the system due to problems at the Lagoon mouth caused by the railroad berm (and other physical alterations) and sediment build-up at the ocean inlet. Note that the Highway 101 bridge abutments were recently replaced and have resulted in improved tidal exchange through the area. As discussed above, reductions in the tidal prism have resulted in increased sediment build-up at the ocean inlet. Sediment deposition at the ocean inlet are primarily a function of littoral forces (Elwany, 2008) and other factors that are largely separate from the sedimentation problems that originate from the watershed. These factors are important to understand in order to effectively manage and improve conditions within the Lagoon, but they are outside the scope of the sediment TMDL analysis.

Consideration of these various lines of evidence indicates that the Lagoon was likely achieving the water quality standard for sediment before the mid-1970s.

4.3 Watershed Numeric Target

A historic coverage for the Peñasquitos watershed was developed for the mid-1970s using US Geological Survey topographic maps (primarily the La Jolla quadrangle-dated 1975). This land-use distribution was used to calculate the watershed numeric target using the LSPC watershed model (see Linkage Analysis, Section 7). This historic (mid-1970s) sediment load of 12,360 tons per critical wet period (211 days), or 58.6 tons per day, represents the sediment TMDL watershed numeric target.

4.4 Lagoon Numeric Target

An analysis of the vegetation types and acreages present in the Lagoon was developed for the mid-1970s using historic aerial photographs ~~from which the Lagoon numeric target was calculated~~ (see Linkage Analysis, Section 7). This analysis determined a historic condition of 420 acres of salt marsh present during the time period. The Lagoon numeric target is expressed as an increasing trend in the total area of tidal saltmarsh and non-tidal saltmarsh toward 346 acres. This target acreage represents 80 percent of the total acreage of tidal and non-tidal saltmarsh present in 1973 (see Section 7.5).

5 Source Assessment

The purpose of the source assessment is to identify and quantify the sources of sediment to the Los Peñasquitos Lagoon. Sediment can enter surface waters from both point and non-point sources. Point sources typically discharge at a specific location from pipes, outfalls, and conveyance channels from, for example, municipal wastewater treatment plants or municipal separate storm sewer systems (MS4s). These discharges are regulated through waste discharge requirements (WDRs) that implement federal NPDES regulations issued by the State Water Board or the San Diego Water Board through various orders. Non-point sources are diffuse sources that have multiple routes of entry into surface waters. Some non-point sources, such as agricultural and livestock operations, are regulated under waivers of waste discharge requirements. The source assessment quantification is measured as an annual or daily load, which is then used to separate the load allocations or wasteload allocations for the TMDL. The following sections discuss the sediment sources that contribute to Los Peñasquitos Lagoon.

5.1 Sediment Processes within the Watershed

Wet weather events can cause significant erosion and transport of sediment downstream (especially from canyon areas below storm water outfalls). Dry weather loading attributes minimal sediment loading via nuisance flows from urban land-use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport the sediment into receiving waters. Due to the higher runoff potential associated with wet weather conditions, emphasis was placed on characterizing wet weather watershed loading.

Wet weather loading is dominated by episodic storm flows that wash off built up sediment on land surfaces, erode canyon areas below storm water outfalls, and scour stream banks. Erosion and scouring are exacerbated by anthropogenic disturbances, such as land~~urban~~ development within the watershed. Development can expose sediment and increase the amount of impervious surfaces on formerly undeveloped landscapes. This reduces the capacity of the remaining pervious surfaces to capture and filter rainfall. As a result, a larger percentage of rainfall becomes runoff during any given storm. Subsequently, runoff reaches stream channels much more quickly, and peak discharge rates and total runoff volume are higher than before development for the same size rainfall event (SCCWRP, 2011). This process is termed hydromodification.

In the Los Peñasquitos Watershed, the results of hydromodification are most pronounced below storm water outfalls in open space areas that discharge into steep drainages, where canyon walls are eroding into creeks. This effect is illustrated in Figure 16. Sediment is transported downstream to the Lagoon during storm events and deposited on the salt flats and in the Lagoon channels.

Figure 16. Erosion of canyon walls below storm drain outfall in the Los Peñasquitos Creek watershed (Garrity and Collison, 2011).

In 2010, a geomorphic assessment of the Peñasquitos watershed was conducted. The goals of the assessment were to identify locations within the watershed that are the main sources of sediment to the Lagoon, identify processes (natural and anthropogenic) that contribute sediment, and identify and prioritize actions to reduce and manage sediment. This study identified multiple segments of Carroll Canyon Creek that highly contribute to sediment production and have increased sediment delivery potentials due primarily to hydromodification effects on open space areas and a channelized segment of Carroll Creek (~~Garrity and Collison~~City of San Diego, 2011).

5.2 Sediment Processes within the Lagoon

Sediment from the watershed is discharged to the Lagoon and then redistributed to other areas of the Lagoon by both anthropogenic and natural processes. Distribution of sediment within the Lagoon is affected by physical impediments within the Lagoon including the constricted Lagoon mouth, the buildup of the floodplain adjacent to the confluence of Los Peñasquitos and Carroll Canyon Creeks, and the railroad berm. These physical impediments do not directly contribute a sediment load to the Lagoon; therefore a daily sediment load for these structures cannot be calculated.

More information on the structure of the Lagoon can be found in Background Section 3.3.

5.3 Sediment Sources

There are two broad categories of sediment sources to the Lagoon: 1) watershed sources, and 2) the Pacific Ocean. The watershed sources consist of all point and non-point sources of sediment in the watershed area draining to Los Peñasquitos Lagoon. The total sediment contribution from all watershed sources is presented as the total wasteload allocation (WLA). Sediment contributions from the Pacific Ocean are considered background sources and are presented as the Load Allocation (LA).

5.3.1 Watershed Point Sources

Direct discharges from the watershed to the Lagoon include discharges from: 1) Carmel, Peñasquitos, and Carroll Canyon Creeks; and 2) gullies adjacent to the Lagoon. These are considered point sources. This is the case because virtually the entire Los Peñasquitos watershed is drained through the Phase I MS4 collection systems. The MS4 collection system is defined as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) (San Diego Water Board, 2007). In addition, and as stated in the San Diego County MS4 permit, historic and current development makes use of natural drainage patterns and features as conveyances for urban runoff. Urban streams used in this manner are part of the municipalities MS4 regardless of whether they are natural, man-made, or partially

modified features. In these cases, the urban stream is both an MS4 and a receiving water (Finding d.3.c, San Diego Water Board 2007). For this reason the Phase I MS4s can be thought of as the primary and ultimate point sources of sediment to the Lagoon.

Storm water runoff is regulated through the following NPDES permits: the San Diego County Phase I municipal separate storm sewer system (MS4) permit, the Phase II MS4 permit for small municipal dischargers, and the statewide storm water permits issued to Caltrans, construction sites, and industrial sites. The permitting process defines these discharges as point sources because storm water is discharged from the end of a storm water conveyance system.

Phase I Municipal Separate Storm Sewer System (MS4)
As discussed above, the Phase I MS4s can be thought of as the primary and ultimate point sources of sediment to the Lagoon. The principal MS4s contributing sediment to the Lagoon are owned or operated by the municipalities located throughout the Peñasquitos watersheds including the City of San Diego, City of Poway, City of Del Mar, and County of San Diego. Note that Caltrans, Phase II MS4s, and several construction and industrial sites discharge into the Phase 1 MS4s.

Phase I MS4s contribute sediment during both dry and wet weather events; however, it is during wet weather events when runoff from storm drain outfalls causes significant erosion along canyon walls below the outfalls and along creek channels that receive these flows. In addition, sediment build-up on land surfaces from various sources is washed into the storm drain outfalls during rainfall events. The increased volume, velocity, frequency and discharge duration of storm water runoff from developed areas has the potential to greatly accelerate downstream erosion, impair stream habitat in natural drainages, and negatively impact beneficial uses. Development and urbanization increase pollutant loads in storm water runoff and the volume of storm water runoff. Impervious surfaces can neither absorb water nor remove pollutants and thus lose the purification and infiltration provided by natural vegetated soil.

The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, interflow and groundwater flow) caused by urbanization or other land use changes is called “hydromodification”, and results in increased stream flows and sediment transport. In addition, alteration of stream and river channels, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.
~~Runoff from urbanized areas into the Phase I MS4s can often be characterized by the term hungry water. Hungry water is used to describe discharges that have little to no sediment content to reduce flow velocities and sediment transport rates. Hungry water exacerbates the natural erosion and scouring processes in natural drainages and within~~

~~the receiving creek. The amount of runoff and associated concentrations are, therefore, highly dependent on the nearby land management practices~~.

Phase II Municipal Separate Storm Sewer System (MS4)

Phase II MS4s are storm water systems that serve public campuses, military bases, and prison and hospital complexes within or adjacent to other regulated MS4s, or which pose significant water quality threats. They are responsible for addressing water quality concerns from their small MS4s. Table 3 identifies the traditional and non-traditional small MS4s within the Los Peñasquitos watershed. Non-traditional small MS4s are federal and State operated facilities that can include universities, prisons, hospitals, military bases.

Table 3. List of traditional and non-traditional small MS4s

Agency	Facility	Address
California Community Colleges	San Diego Miramar College	10440 Black Mountain Road San Diego, CA 92126-2999
University of California	University of California, San Diego	9500 Gilman Drive La Jolla, 92093
State Park	Torrey Pines State Beach	N Torrey Pines Road San Diego, CA 92037

Storm water discharges from Phase II MS4s typically discharge into Phase I storm drain systems. As with Phase I MS4s, pollutants that build up on land surfaces within the small MS4s are washed off during rainfall events. In addition, urbanized areas within the Phase II MS4s also generate ~~"hungry"~~ flows that exacerbate the natural erosion and scouring processes of the creek.

Caltrans MS4s

The storm water discharges from most of the Caltrans properties and facilities within the Peñasquitos watershed discharge into a Phase I MS4 system. As with Phase I MS4s, pollutants build up on land surfaces owned by Caltrans and are washed off during rainfall events. In addition, runoff from these surfaces result in hydromodification~~are "hungry"~~ flows that exacerbate the natural erosion and scouring processes of the receiving creek.

Groundwater Extraction Discharges

Discharges from ground water extraction activities to surface waters are not a contributor of sediment to the Lagoon. These discharges are regulated under waste discharge requirements, which specify that suspended sediment concentrations in the effluent be no more than 50 milligrams per liter and that discharges shall not cause the

rate of deposition of solids and characteristics of inert solids in the sediment to be changed such that benthic communities are degraded.

Discharges of Hydrostatic Test Water and Potable Water
Discharges of Hydrostatic Test Water and Potable Water are those discharges resulting from testing of pipelines, tanks and vessels that are dedicated to drinking water purveyance and storage. These discharges are regulated under waste discharge requirements which require the implementation of Best Management Practices (BMPs) for flow and pollutants prior to entering receiving waters and/or the MS4 system.

Discharges from Utility Vault and Underground Structures
Discharges from Utility Vault and Underground Structures are not a contributor of sediment to the Lagoon. These intermittent discharges range from a few gallons to a few thousand gallons and are routed to the Lagoon directly or indirectly via the Phase I MS4 system.

Construction and Industrial Sites
During wet weather, runoff from industrial and construction sites has the potential to contribute sediment loading to the Lagoon. During dry weather, the potential contribution of pollutant loadings from industrial and construction storm water is low because non-storm water discharges are prohibited or authorized by permit only under the following circumstances: when they do not contain significant quantities of pollutants, where ~~Best Management Practices (~~BMPs~~)~~ are in place to minimize contact with significant materials and reduce flow, and when they are in compliance with San Diego Water Board and local agency requirements.

As of ~~June~~ March 201~~20~~, there were 81~~76~~ industrial facilities ~~covering 1, 304 acres~~ enrolled under the general industrial storm water permit in in the Los Peñasquitos watershed ~~(Figure 17)~~. Table 4 identifies the industrial facilities within the Peñasquitos watershed. These facilities include mining facilities, manufacturing facilities, transportation facilities, etc. Potential pollutants from an industrial site will depend on the type of facility and operations that take place at that facility. Facilities that discharge sediment have a potential to adversely impact the impaired Lagoon. For example, the two sand mining operations in Carroll Canyon have the potential to discharge sediment from their~~its~~ operation. Facilities with impervious surfaces or that alter the natural drainage of a watercourse also have the potential to adversely impact the impaired Lagoon.

Table 4~~3~~. List of industrial facilities

Operator	Facility	Address
US Marine Corps Commanding Gen	US Marine Corp Air Station Mir	45249 Miramar Way, San Diego, CA 92145

Operator	Facility	Address
Sycamore Landfill Inc	Sycamore Landfill	14494 Mast Blvd, San Diego, CA 92145
Hanson Aggregates Pacific Southwest	Hanson Aggregates	9229 Harris Plant Rd, San Diego, CA 92145
New Leaf Biofuel	New Leaf Biofuel	2285 Newton Ave, San Diego, CA 92124
Fyfe Co LLC	Fyfe Co LLC	8380 Miralani Dr, San Diego, CA 92126
Vulcan Material dba Cal Mat Co	Carroll Canyon Aggregates	10051 Black Mountain Rd, San Diego, CA 92126
Hydranautics	Hydranautics	8270 Miralani Dr, San Diego, CA 92126
YRC Inc	YRC Inc	9525 Padgett St, San Diego, CA 92126
Ontrac	Ontrac	7077 Consolidated Way, San Diego, CA 92121
Penick II LLC	Olson dr	9747 Olson Dr, San Diego, CA 92121
Miramar Truck Center	Miramar Truck Center	6066 Miramar Road, San Diego, CA 92121
Penske Logistics LLC	Penske Logistics LLC	7170 Miramar Rd Ste 800 to 900, San Diego, CA 92121
Bimbo Bakeries USA	Bimbo Bakeries USA	5662 Eastgate Dr, San Diego, CA 92121
Illumina Inc	Research Place	5200 Research Pl, San Diego, CA 92121
California Precision Products Inc	California Precision Products Inc	6790 Flanders Dr, San Diego, CA 92121
Tayman Industries Inc	Tayman Industries Inc	5692 Eastgate Dr, San Diego, CA 92121
Illumina Inc	Carroll Park Dr Facility	9440 Carroll Park Dr, San Diego, CA 92121
California Commercial Asphalt	Carroll Canyon	9234 Camino Santa Fe, San Diego, CA 92121
Ametek Programmable Power	Ametek Programmable Power	9250 Brown Deer Rd, San Diego, CA 92121
Leed Recycling	Leed Recycling	8725 Miramar Pl, San Diego, CA 92121
Westside Building San	Westside Building San	7465 Carroll Rd,

Operator	Facility	Address
Diego LLC	Diego LLC	San Diego, CA 92121
West Tech Contracting Inc	West Tech Contracting	7625 Carroll Rd, San Diego, CA 92121
Integrated Microwave Corp	Integrated Microwave Corp	11353 Sorrento Valley Rd, San Diego, CA 92121
Angel P Hayes	Aquarius Marine	9384 Frost Mar Pl, San Diego, CA 92121
Stone Yard Inc	Stone Yard Inc	8980 Crestmar Point, San Diego, CA 92121
Old Dominion Freight Lines	Old Dominion Freight Lines	9850 Olson Dr, San Diego, CA 92121
Josh Degano	PCF Group	8585 Miramar Pl, San Diego, CA 92121
Expo Industries INC	Expo Industries INC	7455 Carrol Rd, San Diego, CA 92121
Deere & Company	T Systems International	7545 Carroll Rd, San Diego, CA 92121
Dale L Watkins	Shefield Platers Inc	9850 Waples St, San Diego, CA 92121
RR Donnelley	RR Donnelley	7590 Carroll Rd, San Diego, CA 92121
Pacira Pharmaceuticals, Inc.	Pacira Pharmaceuticals	10450 Science Center Dr, San Diego, CA 92121
USF Reddaway Inc Yrc Worldwide Enterprise Services Inc	USF Reddaway Inc 398 SDO	7075 B Carroll Rd, San Diego, CA 92121
Robertsons Ready Mix	Robertsons Miramar Plant	5692 Eastgate Dr, Miramar (2), CA 92121
United Parcel Service Freight	UPS Ground Freight Inc	7075 A Carroll Rd, San Diego, CA 92121
MZ3D Inc	MZ3D Inc	10739 Roselle St, San Diego, CA 92121
FedEx HD Pomona Industry	FedEx Ground Home Delivery	8515 Miramar Place, San Diego, CA 92121
ATK Space Systems	ATK Space Systems	9617 Distribution Ave, San Diego, CA 92121
Rhino Linings Inc	Rhino Linings Inc	9151 Rehco Rd, San Diego, CA 92121
San Diego City	Pump Station 64	10745 Roselle St,

Operator	Facility	Address
		San Diego, CA 92121
San Diego City	Pump Station 65	12112 Sorrento Valley Rd, San Diego, CA 92121
Illumina Inc	Illumina Inc	9885 Towne Centre Dr, San Diego, CA 92121
Quikrete	Quikrete	9265 Camino Santa Fe, San Diego, CA 92121
Allan Co	Allan Co	6733 Consolidated, San Diego, CA 92121
MJB Freight Systems	Mjb Freight Systems	6225 Marindustry Dr, San Diego, CA 92121
FedEx Freight Whittier	Fed Ex Freight West	5550 Eastgate Mall, San Diego, CA 92121
Dixieline Lumber Co	Dixieline Lumber Ne Miramar	7292 Miramar Rd, San Diego, CA 92121
Calbiochem Nova Biochem	EMD Biosciences Inc	10394 Pacific Center Ct, San Diego, CA 92121
Hanson Aggregates Pacific Southwest	Hanson Aggregates	9255 Camino Santa Fe, San Diego, CA 92121
San Diego City	San Diego City N City Water Re	4949 Eastgate Mall, San Diego, CA 92121
Pall Filtration & Separations	Pall Filtration & Separations	4116 Sorrento Valley Blvd, San Diego, CA 92121
Fed Ex	Fed Ex	10585 Heater Ct, San Diego, CA 92121
Fed Ex Ground Packaging System	Fed Ex Ground	9999 Olson Dr, San Diego, CA 92121
San Diego Gas & Electric	San Diego Gas & Electric Miram	6875 Consolidated Way, San Diego, CA 92121
Presidio Components Inc	Presidio Components Inc	7169 Construction Ct, San Diego, CA 92121
Qualcomm Inc	Qualcomm Inc	5525 Morehouse Dr, San Diego, CA 92121
Escondido Ready Mix	San Diego Ready Mix	9245 Camino Santa Fe, San Diego, CA 92121
Overnite Transportation	UPS Freight	7191 Carroll Rd, San Diego, CA 92121
RE Hazard Contracting Co	Re Hazard Contracting Co	6465 Marindustry Dr # 6485,

Operator	Facility	Address
		San Diego, CA 92121
Titan Linkabit	Titan	3033 Science Park Rd, San Diego, CA 92121
Frazee Paint	Frazee Paint	6625 Miramar Rd, San Diego, CA 92121
Van Can Co	Van Can Co	9045 Carroll Way, San Diego, CA 92121
IMS Electronics Recycling Inc	IMS Electronics Recycling Inc	12455 Kerran St 300, Poway, CA 92064
Mobile Mini Inc	Mobile Mini Inc	12345 Crosthwaite Cir, Poway, CA 92064
General Atomics Aeronautical Sys Inc Bldgs 14 & 15	General Atomics Aeronautical Sys Inc Bldgs 14 & 15	14107 Stowe Dr, Poway, CA 92064
Toray Membrane USA Inc	Toray Membrance USA Inc	13435 Danielson St, Poway, CA 92064
Joe Peterson	San Diego Crating and Packing	12678 Brookpriuter Pl, Poway, CA 92064
Sysco Food Services of San Diego	Sysco Food Services of San Diego	12180 Kirkham Rd, Poway, CA 92064
San Diego Granite Inc	San Diego Granite Inc	13026 Stowe Dr, Poway, CA 92064
FedEx Freight Inc	FedEx Freight Inc ESD	12055 Tech Center Dr, Poway, CA 92064
Atlas Transfer & Storage	Atlas Transfer & Storage	13026 Stowe Dr, Poway, CA 92064
All State Van & Storage Inc	All State Van & Storage Inc	12356 Mc Ivers Cct, Poway, CA 92064
Uke, Alan	Underwater Kinetics	13400 Danielson St, Poway, CA 92064
Poway City	Poway City Material Landing Fa	12325 Crosthwaite Cir, Poway, CA 92064
Valley Metals	Valley Metals	13125 Gregg St, Poway, CA 92064
Halllmark Circuits Inc	Hallmark Circuits Inc	13500 Danielson St, Poway, CA 92064
Vulcan Material dba Cal Mat Co	Poway	10975 Beeler Canyon Rd, Poway, CA 92064
County of San Diego	Poway Landfill	14600 Poway Rd,

Operator	Facility	Address
		San Diego, CA 92064
POWAY UNIFIED SCHOOL DISTRICT	Poway USD Transportation	13626 Twin Peaks Rd, Poway, CA 92064
Cor O Van Co	Cor O Van Co	12375 Kerran St, Poway, CA 92064
Designer Molecules Inc	Designer Molecules Inc	10080 Willow Creek Rd, San Diego, CA 92131

As of June 2010, there were 23 construction sites covering 442 acres enrolled under the general construction storm water permit in the watersheds draining to the Lagoon (Figure 17). While construction projects are intermittent and occur over relatively short durations, sediment loads from these projects can be significant.

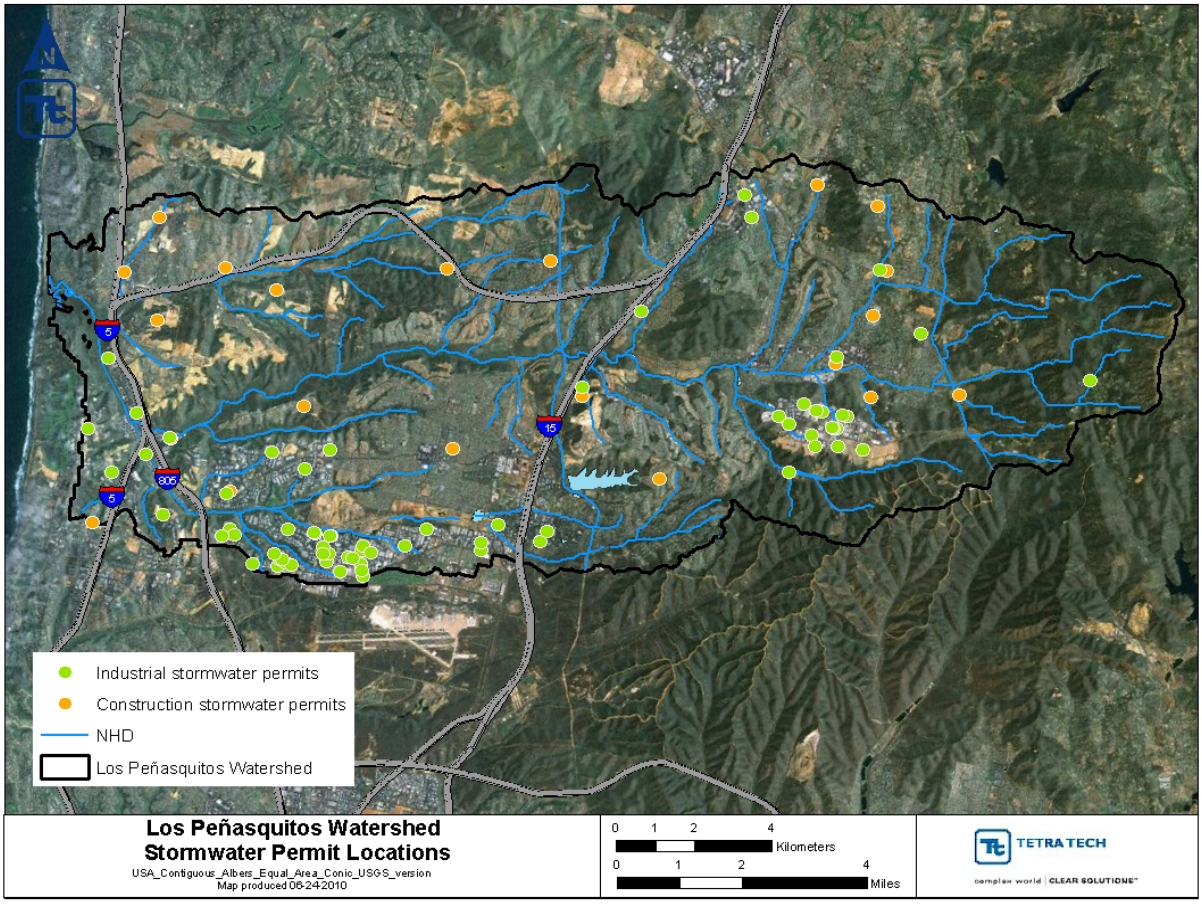

Figure 17. NPDES construction and industrial storm water permits as of June 2010.

5.3.2 Watershed Non-Point Sources

In this TMDL, the watershed sources also include all the *non-point sources located in the watershed* such as agriculture (1 percent of year 2000 land-use area) and open space (43 percent of year 2000 land-use area). This is the case because virtually the entire Los Peñasquitos watershed is drained through the Phase I MS4 collection systems. The total sediment contribution from all watershed sources is presented as the WLA.

5.3.3 Ocean Sediment Sources

~~Wave run up, storm surges and ocean tides are a source of sediment to the mouth of the Lagoon. One study found that accumulated sediment at the Lagoon's ocean inlet was similar to beach sediment and tidal sources (Elwany, 2008).~~ Ocean sediment contributions are considered a background source and accordingly an LA is assigned to ocean sediment contributions from storm surges and wave action along the ocean boundary (see Identification of Load Allocations and Reductions Section 8.8). Sediment loads from the ocean are primarily a function of littoral forces and other factors that are largely separate from the sedimentation problem originating from the watershed.

There is a natural tendency for wave-deposited sand to accumulate at the mouth of Los Peñasquitos Lagoon. This leads to the gradual formation of a broad sand bar in the vicinity of the junction of the two main branches of the lagoon drainage system. ~~The channels tend to become braided and constricted as the sand moves inland. When the height of the sand bar reaches approximately four feet above mean sea level, tidal circulation in the lagoon ceases (Mudie, 1974).~~ However, ocean sediments are dredged routinely from the Lagoon mouth to alleviate the danger of flooding and to improve the health of the Lagoon. Because ocean sediments are dredged, ocean sediments do not traverse up Lagoon channels to directly fill in saltmarsh habitat nor do ocean sediments restrict tidal flow at the mouth, which indirectly affects the ability of the tidal prism to maintain soil salinities.

5.4 Quantification of Watershed Sediment Sources

Sediment sources were quantified by land-use group because sediment loading is highly correlated with land-use practices. Since several land-use types share hydrologic or pollutant loading characteristics, many were grouped into similar classifications, resulting in a subset of nine categories for modeling. Selection of these land-use categories was based on the availability of monitoring data and literature values that could be used to characterize individual land-use contributions and critical sediment-contributing practices associated with different land uses. For example, multiple urban categories were represented independently (e.g., high density residential, low density

residential, and commercial/institutional), whereas other natural categories were grouped. The three major land-use sources in the watershed are open space, low density residential, and industrial/transportation. All land uses were classified as generating point source loads because, although the sediment sources within the watershed may be diffuse in origin, the pollutant loading is transported and discharged to the Lagoon waters through the storm water conveyance system.

The sediment load contributed by each land-use type was calculated using the LSPC model (note that unpermitted direct discharges of sediment to receiving waters were not explicitly quantified in the modeling analysis). Modeling parameters were varied by land use to provide the correlation between sediment loading and land-use type. More information on land uses is contained in Background Section 3.2 and the Modeling Report (Attachment 2).

6 Data Analysis and Inventory

Multiple data sources were used to characterize the watershed and Lagoon, including stream flow and water quality conditions. Much of this information was recently collected by watershed stakeholders to assist with TMDL model development. Data describing the watershed's topography, land use, soil characteristics, meteorological data, and irrigation needs along with available bathymetric survey information and data sondes analyzing pressure and salinity were used to calibrate the watershed and Lagoon models. The Technical Support Document (Attachment 1) summarizes stream flow and total suspended sediment data used for calculation of the watershed numeric target.

7 Linkage Analysis

The technical analysis of the relationship between pollutant loading from identified sources and the response of the waterbody to this loading is referred to as the linkage analysis. The purpose of the linkage analysis is to quantify the maximum pollutant loading that can be received by an impaired waterbody and still attain the WQOs of the applicable beneficial uses. This numeric value is represented by the TMDL.

The linkage analysis for this TMDL is based on biological index linkages and computer models that were developed to represent the physical processes within the impaired receiving waterbody and associated watershed. The models provided estimation of sediment loadings from the watershed based on rainfall events, land use, and simulation of the response of the receiving water to these loadings. The following sections provide more detailed discussion regarding model selection and linkage analysis.

7.1 Linkage of Targets and Sources to Beneficial Uses

As discussed in the Numeric Targets section 4, this TMDL finds that the water quality objective for sediment in the Lagoon was being attained and beneficial uses were being supported under historic conditions (mid-1970s). It follows that the Lagoon was capable of assimilating historic sediment loads under historic Lagoon conditions. The historic Lagoon condition has evolved through time with continual natural and anthropogenic sediment deposition and alterations to the Lagoon's natural systems, including: constriction of the Lagoon's floodplain by development, relocation of the Lagoon's natural ocean inlet, year round fresh water input, elevated peak discharges and volumes of storm runoff from impervious surfaces, and construction of two railway berms across the Lagoon.

Development within the Lagoon and increased sediment discharge to the Lagoon over time has contributed to sediment buildup and higher elevations that limit tidal flow and the extent of saltmarsh vegetation. This trend has resulted in adverse impacts to beneficial uses, in particular, the estuarine (EST) and preservation of biological habitats of special significance (BIOL) beneficial uses. Deposition of watershed sediment contributes to elevation increases within the Lagoon, leading to an increase in height relative to mean sea level. Elevation is a critical variable that determines the productivity, diversity, and stability of saltmarshes (e.g. see Pennings and Callaway 1992, Zedler and Callaway 2000). The long-term existence of the saltmarsh depends on the success of the dominant plants, such as *Sarcoconia pacifica* (*Salicornia virginica*) and *Frankenia salina*, and their close relationship to sediment supply, sea level change, soil salinity, and tidal range (US EPA, 2005). This subset of estuarine habitat is of

particular biological significance as it is estimated that only 10 percent of the original coastal marshland in San Diego County remains in existence (Mudie et al. 1974).

Watershed and Lagoon numeric targets were identified to calculate the watershed sediment load reduction required based on historical analysis, account for impairment of saltmarsh due to historic sediment loads, and to track implementation success.

It is expected that reduced sediment loading from storm water discharges consistent with the watershed sediment reduction target will encourage the establishment of native vegetation in degraded areas through various mechanisms. Implementation actions designed to reduce sedimentation will also likely reduce nuisance freshwater flows into the Lagoon that have contributed to observed habitat and beneficial use impacts. An adaptive management approach will be used to determine the most effective course of action to achieve the numeric targets and improve beneficial uses in the Lagoon (see Implementation Plan Section 9.3). Ultimately, sediment removal in some areas may be needed to remove the excess anthropogenic sediment that has been deposited since the mid-1970s to meet the requirements of this TMDL and to re-establish elevations conducive to saltmarsh habitats progression and diversity of species, as well as improved connectivity between the watershed, Lagoon, and tidal flow.

Reducing watershed sediment loads from the year 2000 levels to historic levels (mid 1970's) is a necessary component for restoring and providing long-term protection of the Lagoon's beneficial uses. To represent the linkage between source contributions and receiving water response, a dynamic water quality model was developed to simulate source loadings and transport of sediment into the Lagoon. The models provide an important tool to evaluate year 2000 conditions, to evaluate historic conditions, and to calculate TMDL load reductions.

As mentioned before, sedimentation within coastal estuaries and lagoons is a natural process, recently augmented by human activities in the watershed over the last 200 years with the majority of sedimentation impacts occurring over the past 40 years (see Figures 14 and 15). It is believed that the Lagoon was capable of assimilating these historic sediment loads under the historic Lagoon condition. Because the Lagoon has been impacted by sediment accumulation, as demonstrated by the type changes in salt marsh habitat over the last 40 years from watershed sediment loads and hydrologic inputs, it cannot be assumed that the Lagoon, in the year 2010 condition, can assimilate the same elevated sediment loads. The historic condition represents a time period prior to major land development in the watershed, but occurs at a period following major physical modifications to the lagoon (e.g. see Figure 14). Thus, the ~~E~~evaluation of the extent of vegetation types in the Lagoon provides the necessary tool to assess how the

Lagoon responds to watershed sediment load reductions and to establish a target Lagoon condition under which the Lagoon can again assimilate the historic mid-1970's sediment loads.

7.2 Model Selection and Overview

In selecting an appropriate approach for TMDL calculation, technical and regulatory criteria were considered. Technical criteria include the source contributions, critical conditions, constituents to be addressed, and the physical domain, which is one of the most important considerations in model selection and accounts for both watershed and receiving water characteristics and processes. Regulatory criteria include water quality objectives and procedural protocol such as US EPA's *Protocol for Developing Sediment TMDLs*. In selecting a modeling framework, the models' ability to enable direct comparison of model results to the selected numeric target must be considered. For the watershed loading analysis and implementation of required reductions, it is also important that the modeling framework allow for the examination of gross land-use loading.

The selected modeling system was divided into two components representative of the processes essential for accurately modeling hydrology, hydrodynamics, and water quality. The first component of the modeling system, the Loading Simulation Program in C++ (LSPC) model, is a watershed model that predicts runoff and external pollutant loading as a result of rainfall events. The second component, the Environmental Fluids Dynamic Code (EFDC) model, is a hydrodynamic and water quality model that simulates the complex water circulation and pollutant transport patterns in the Lagoon. LSPC was specifically used to simulate watershed hydrology and transport of sediments in the streams and storm drains flowing to the impaired Lagoon. The LSPC model was linked to the EFDC model to provide all freshwater flows and loadings as the EFDC model input.

The LSPC and EFDC models were used to calculate both historic and year 2000 conditions to establish the watershed numeric target and required load reductions from year 2000 conditions.

A complete discussion, including model configuration, hydrologic and hydrodynamic calibration and validation, and water quality calibration and validation of the LSPC and EFDC models is provided in the Modeling Report (Attachment 2). In summary, these models rely on several assumptions that attempting to predict natural processes in a highly complex system. However, models can still provide a useful tool for management

decisions and their accuracy can be improved with the type and amount of data used to calibrate them.

The TMDL is not limited by the models or their implementation; however, the nature of the variability of precipitation in Southern California, which leads to an extremely difficult sampling problem, coupled with the lack of bank erosion and bed load transport data creates a degree of uncertainty in the TMDL. In light of this uncertainty, this TMDL establishes a Margin of Safety (MOS; see Section 8.11) and establishes an adaptive management approach, in which an effective monitoring system is put in place to obtain detailed sediment loading data while monitoring the response of the Lagoon.

7.3 Model Application

The models were initially calibrated to hydrologic and water quality data (see Section 6) to characterize year 2000 conditions in the watershed and Lagoon. Land-use conditions present during the mid-1970s were associated with loads that met the sediment WQO to characterize historic (mid-1970s) conditions. The 1993 El Niño time period (the critical wet period, October 1, 1992-April 30, 1993) was used to calculate sediment loads under historical and year 2000 conditions. Model simulations were performed using the same meteorological data to accurately compare the watershed and Lagoon response to the same weather conditions.

The resulting historical net annual sediment load was identified as the watershed numeric target, which represents the loading (assimilative) capacity for the Lagoon (i.e. the TMDL). Historic loads define the allowable load; therefore, required load reductions represent the difference between year 2000 sediment loads and historic (allowable) loads.

7.4 Mapping Vegetation Types in the Lagoon

Through the aerial photo interpretation effort, vegetation types of the Los Peñasquitos Lagoon were estimated for the year 1973 (historical conditions) and year 2010. Aerial photography has long been used to map and assess changes to wetlands (White and Greer, 2002).

Aerial photos were acquired from the County of San Diego to characterize historical vegetation types within the Lagoon. The vegetation types were interpreted from 1:12,000 scale, 1,200 dots per square inch scans of photos by staff at California State Parks. The photography was captured on November 25, 1973 with the exception of the southernmost photo, which was captured on June 17, 1974.

Aerial photos were acquired from USA Prime Imagery map service to characterize the year 2010 vegetation types within the Lagoon. The vegetation types were interpreted from the high resolution photos by staff at California State Parks. The photography was acquired for the fall of 2010 aerial from USA Prime Imagery's I3_Imagery_Prime_World_2D map. This map presents satellite imagery for the world and high-resolution aerial imagery for the United States.

The photos representing historical vegetation types were geo-referenced to a minimum four locations within the marsh or low lying uplands to existing digital imagery. The fit appeared reasonable as transitions from one aerial to the next were not obviously misaligned and delineations fit well to modern high resolution aerial images. Individual pairs of points with high root mean square errors (RMSE) were discarded and replaced until an acceptable overall RMSE was achieved. The RMSE quantifies the distortion between a scanned aerial image and a rectified, geo-referenced base map. The average RMSE for the overall study was 7.65 pixels or 9.10 meters.

Vegetation types for historic and year 2010 conditions were heads-up digitized onscreen (at an approximate 1:2,500 scale), interpreted, and mapped into generalized classifications that could be reliably interpreted without field verification. Neither field verifications nor accuracy assessments were conducted. However, supplemental data was used to determine coarse elevations and vegetation types, including from SanGIS 2-foot topography and Google maps oblique aerials.

Vegetation types were classified as saltmarsh, non-tidal saltmarsh, ~~freshwater marsh,~~ non-tidal saltmarsh–*Lolium perrene* infested, freshwater marsh, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover (urban, beach, dune, upland vegetation, etc.). Vegetation types are described below. Vegetation type extents under historic (mid-1970s) and year 2010 conditions are illustrated in Figures 18 and 19.

Saltmarsh

Description:	Exists below 6 feet (mean sea level) in elevation with an obvious tidal connection and no obvious presence of annual grasses or freshwater marsh vegetation. Also includes salt panne, mudflat, and tidal channels.
Indicators:	Deep brown and red-orange, smooth textured vegetation.

Common Species: *Sarcoconia pacifica* (*Salicornia virginica*)*, Frankenia grandiflora, Juamea carnosa*.
Confidence: Moderate-High. High confidence that vegetation is saltmarsh. Moderate confidence that this vegetation is tidal.

Non-tidal Saltmarsh
Description: Exists above 4 feet (mean sea level) in elevation with no obvious tidal connection, but presence of annual grasses or freshwater marsh vegetation.
Indicators: Deep brown and red-orange, smooth textured vegetation, but lighter in color than tidal saltmarsh due to less moisture. Includes salt panne with no obvious tidal connection.
Common species: *Sarcoconia pacifica* (*Salicornia virginica*)*, Frankenia grandiflora*. Vegetation distant from tidal connection has higher cover of *Frankenia salina* (orange color in aerials) and includes more brackish species (such as *Scirpus maritimus* and *Iva hayesiana*). This vegetation could be considered cismontane alkali marsh.
Confidence: Moderate-High. High confidence that vegetation is saltmarsh. Moderate confidence that this vegetation is non-tidal.

Non-tidal Salt Marsh – *Lolium perrene* infested
Description: Exists above 4 feet (mean sea level) in elevation with no obvious tidal connection. Dominated by annual grasses with presence of saltmarsh vegetation.
Indicators: Straw color of senescent annual grasses.
Common species: *Sarcoconia pacifica* (*Salicornia virginica*), *Frankenia grandiflora, Lolium perenne*. Could also contain *Bromus diandrus* or other non-native grass.
Confidence: Moderate.

Freshwater Marsh
Description: Freshwater marsh vegetation.
Indicators: Taller statured, more round-patterned, and pillowy-textured than saltmarsh and non-tidal saltmarsh vegetation. Lighter color than saltmarsh and non-tidal saltmarsh. Smooth texture and light color compared to Southern Willow Scrub/Mulefat Scrub.
Common species: *Typha* spp., *Scirpus californica, Scirpus americanus*
Confidence: High.

Southern Willow Scrub/Mulefat Scrub

Description: Tall-statured woody vegetation.
Indicators: Lumpy textured, bright green color. Presence of shadows.
Common species: *Salix lasiolepis, Baccharis sarothroides*.
Confidence: High.

Herbaceous Wetland (Unknown or Transitional Vegetation)

Description: A variety of vegetation types and textures mixed at close scales.
Indicators: Areas difficult to differentiate between vegetation types.
Common species: non-native grasses, freshwater marsh species, saltmarsh species, *Leymus tritichoides, Scirpus maritimus*, and others
Confidence: High.

Upland Land Cover (Urban, Beach, Dune, Upland Vegetation, etc.)

Description: Non-wetlands.
Indicators: Areas with urban infrastructure or non-wetland vegetation.
Common species: n/a
Confidence: High.

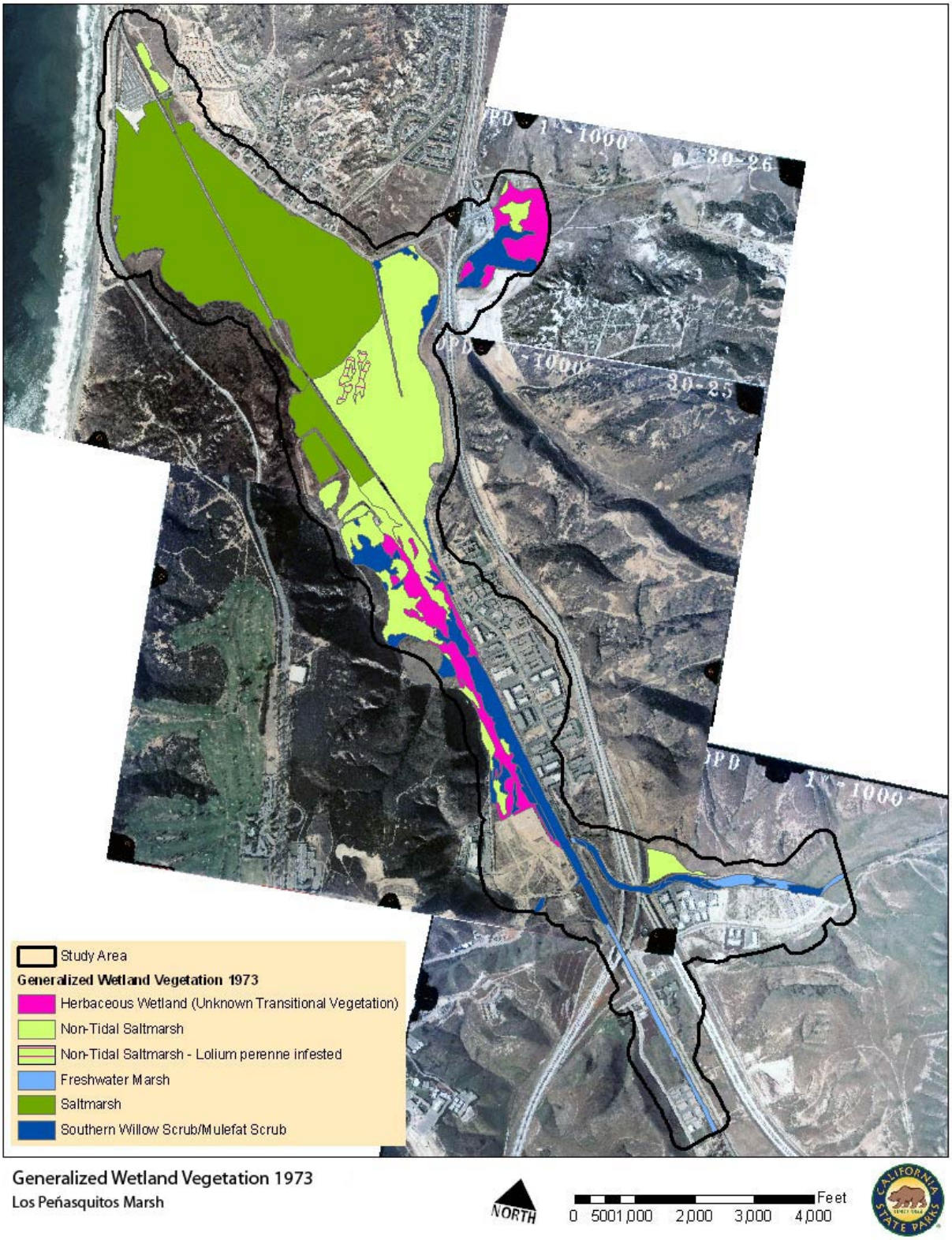

Figure 18. Historic wetland habitats within Los Peñasquitos Lagoon (California State Parks, 2011).

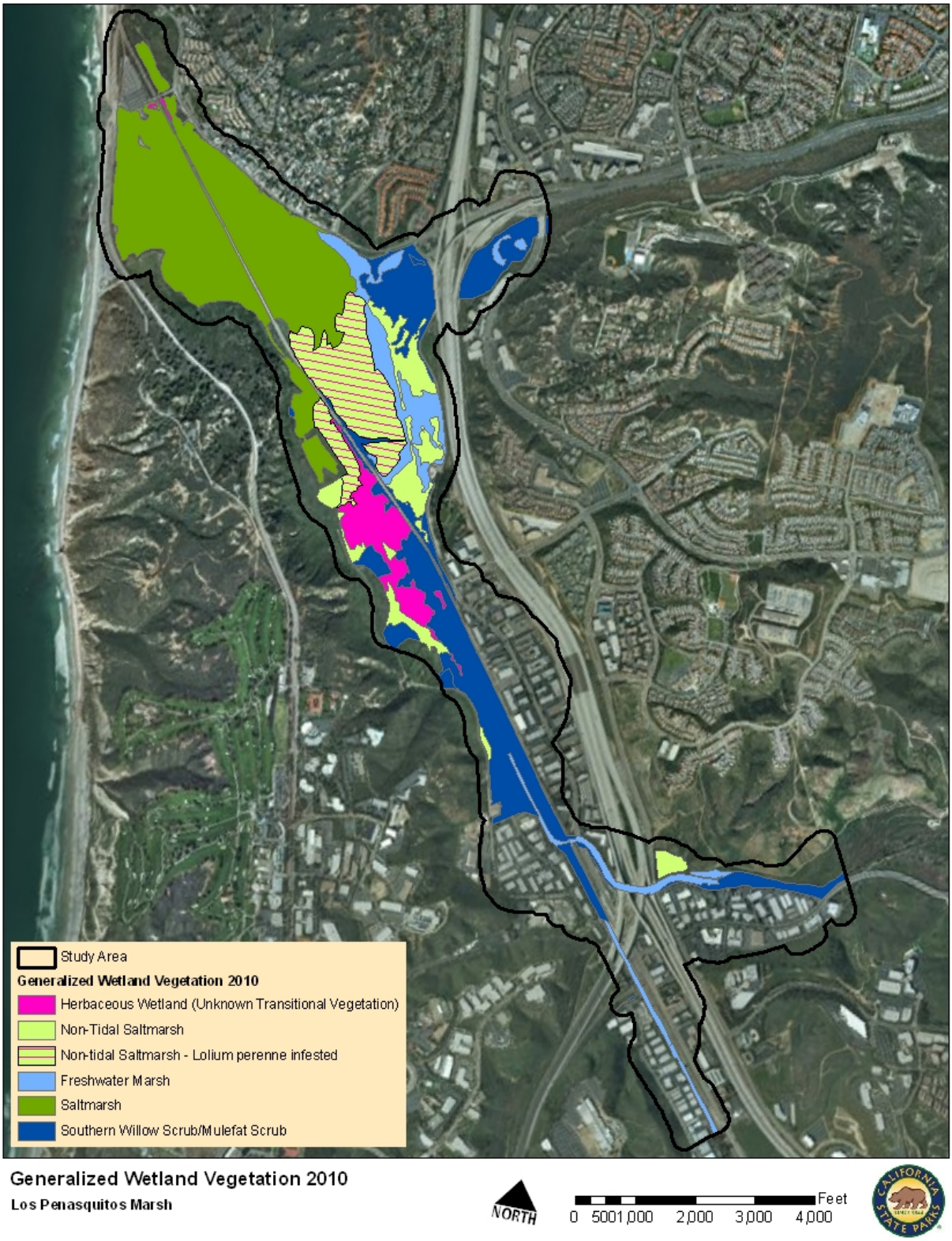

Figure 19. Year 2010 wetland habitats within Los Peñasquitos Lagoon (California State Parks, 2011).

7.5 Lagoon Mapping Application

Conditions present during the mid-1970s were associated with loads that met WQOs and did not adversely impact the Lagoon. To characterize this historical period, historic extent of vegetation types for the Lagoon were developed based on best available aerial photographs. Changes in vegetation types from 1973 to 2010 are summarized in Table ~~5~~3.

Table ~~5~~3. Summary of historical and year 2010 Lagoon vegetation types

Vegetation Types	1973 acreage (ac)	2010 acreage (ac)	Change in acreage (ac)
Saline Vegetation			
Tidal Saltmarsh	255	217	-38
Non-Tidal Saltmarsh	175	45	-130
Subtotal Saline	430	262	-168
Other Vegetation			
Non-tidal Saltmarsh - *Lolium perenne* (Perrenial Rye Grass) Infested, Non-native	4	67	63
Southern Willow Scrub/Mulefat Scrub	71	147	76
Freshwater Marsh	12	55	43
Herbaceous Wetland (Unknown or Transitional Vegetation)	49	34	-15
Subtotal Saline and Other Wetlands	566	565	-1
Upland Land Cover (Urban, Beach, Dune, Upland Vegetation, etc.)	639	640	1
Total Study Area	1205	1205	

The proposed numeric target highlights the importance of maintaining the critical saltmarsh and non-tidal saltmarsh habitats for protection of beneficial uses. Because the total study area of the Lagoon is constant, any increase in saltmarsh and non-tidal saltmarsh areas must be realized by reducing other areas. Of greatest priority and preference is the increase in areas of high biological importance (tidal saltmarsh and non-tidal saltmarsh) and reduction of areas with less biological importance, most notably the area identified as non-tidal saltmarsh-*Lolium perenne* infested. The Lagoon's 565 acres of non-upland land cover include 262 acres of tidal saltmarsh (including salt panne, tidal channels, and mudflats) and non-tidal saltmarsh and 132 acres of freshwater marsh, herbaceous wetland, and woody riparian (for example southern willow scrub and mulefat scrub) habitats. The remaining 171 acres of

vegetation (not considering upland) is impaired and converted from coastal saltmarsh to *Lolium perenne* infested non-tidal saltmarsh, freshwater marsh, and woody riparian habitats (California State Parks, 2011).

The Lagoon numeric target is expressed as an increasing trend in the total area of tidal saltmarsh and non-tidal saltmarsh toward 346 acres. This target acreage represents 80 percent of the total acreage of tidal and non-tidal saltmarsh present in 1973.

Historic saltmarsh and non-tidal saltmarsh acreage is equivalent to 430 acres with 168 acres lost due to sedimentation, freshwater, and other physical factors discussed in the Background section of this Staff Report. Without available studies to determine what proportion of this loss is due to sedimentation over other factors, best professional judgment is used to determine the amount of habitat loss due to historic sediment discharges.

The target tidal and non-tidal saltmarsh acreage was calculated based upon the total acreage of tidal and non-tidal saltmarsh lost multiplied by a factor of 0.5. A factor of 0.5 indicates that half the acreage of tidal and non-tidal saltmarsh lost is due to sedimentation or 84 acres. Subtracting this lost acreage due to sedimentation from the historic extent of tidal and non-tidal saltmarsh results in the target acreage of 346 acres of tidal and non-tidal saltmarsh. This target acreage represents 80 percent of the total acreage of tidal and non-tidal saltmarsh present in 1973 and provides a reasonable consideration of factors beyond sedimentation that have led to the loss of saltmarsh and non-tidal saltmarsh.

If insufficient acreage is available for remediation based on the results of future monitoring efforts and field investigations, the Lagoon numeric target may be adjusted according to the amount of areas that are present and feasible for restoration. Any revision to the Lagoon numeric target will require a Basin Plan amendment (see Reconsiderations section 9.7).

8 Identification of Load Allocations and Reductions

The calibrated models and Lagoon mapping were used to simulate historical and year 2000 sediment loads to the Los Peñasquitos Lagoon from which numeric targets and load reductions were established. This section discusses the methodology used for TMDL development and the resulting loading capacities and required load reductions for Los Peñasquitos Lagoon. Other TMDL components are also discussed including the margin of safety (MOS), seasonality and critical conditions, and a daily load expression.

8.1 Loading Analysis

Year 2000 sediment loads to the Lagoon were estimated using the calibrated LSPC model, and receiving water conditions were simulated using the EFDC model (see Linkage Analysis, Section 7). Using the EFDC model, the assimilative capacity of the Lagoon was assessed and compared to the historical numeric target for evaluation of sediment loading.

8.2 Application of Numeric Targets

As discussed in Section 4, the narrative WQO for sediment was interpreted using a weight of evidence approach to determine a reference condition to define the TMDL numeric target (i.e., a historical period when the Lagoon was not impaired for sedimentation). Several lines of evidence were used to establish the mid-1970s as the historic time period including urbanization trends, population data, flow data, and evaluation of Lagoon conditions over time. The watershed and Lagoon numeric targets were determined using modeling and Lagoon mapping under historical (mid-19~~0~~70s) conditions.

8.3 Load Estimation

Estimation of year 2000 watershed loading to the impaired Lagoon required use of the LSPC model to predict flows and sediment loads. The dynamic model-simulated watershed processes, based on observed rainfall data as model input, provided temporally variable load estimates for the critical period. These load estimates were simulated using calibrated and validated land-use specific processes associated with hydrology and sediment transport (see Attachment 2).

8.4 Identification of Critical Conditions

Due to the higher transport potential of sediment during wet weather, the 1993 El Niño time period was selected as the critical period for assessment. The 1993 El Niño time period (October 1, 1992-April 10, 1993) is one of the wettest periods on record over the past several decades. Statistically,

1993 corresponds with the 93rd percentile of annual rainfall for the past 15 years measured at the San Diego Airport (Lindbergh Field). Selection of this year was also consistent with studies performed by the Southern California Coastal Water Research Project (SCCWRP). An analysis of rainfall data for the Los Angeles Airport from 1947 to 2000 shows that 1993 was the 90th percentile year; meaning 90 percent of the years between 1947 and 2000 had less annual rainfall than 1993 (Los Angeles Water Board, 2002).

The watershed numeric target and load reductions were calculated based on modeling of historical (mid-1970s) land-use conditions and the same meteorological data in order to accurately compare the watershed and Lagoon response to the same weather conditions

8.5 Critical Locations for TMDL Calculation

Due to the variability and dynamic nature of conditions within the Lagoon (e.g., mouth closures, tidal fluctuations, sediment fate and transport, etc.), the entire modeled Lagoon area was assessed as the critical location. Load reductions for sediment were based on achieving the numeric TMDL target across the Lagoon.

8.6 Calculation of TMDL and Allocation of Loads

Conceptually, a TMDL is represented by the equation:

$$TMDL = \sum WLAs + \sum LAs + MOS$$

The wasteload allocation (WLA) portion of this equation is the total loading assigned to point sources. The load allocation (LA) portion is the loading assigned to non-point sources. The margin of safety (MOS) is the portion of loading reserved to account for any uncertainty in the data and computational methodology. An ~~explicit~~ implicit MOS was incorporated for this TMDL.

Load calculations for sediment were developed based on watershed modeling results and meteorological conditions ~~using land-use based generation rates and meteorological conditions from the critical wet period (October 1, 1992-April 10, 1993)~~.

8.7 Wasteload Allocations

The point sources identified in the Los Peñasquitos watershed are Phase I MS4 co-permittees (San Diego County and the cities of San Diego, Poway, and Del Mar), Phase II MS4s, Caltrans, and construction and industrial storm water permit holders. The year 2000 estimated loads were solely the result of watershed runoff (land-use based) and streambank erosion and not other types of point sources. The total sediment contribution from all responsible parties in the watershed is presented as the WLA.

8.8 Load Allocations

According to federal regulations (40 CFR 130.2(g)), load allocations (LA) are best estimates of the non-point source or background loading. For the Los Peñasquitos watershed, ~~land-use~~non-point source contributions to MS4 systems are included in the WLAs described above, including contributions due to hydromodification and accelerated erosion. An LA was assigned to sediment contributions from storm surges and wave action along the ocean boundary (ocean sediment contributions). The ocean is a background source of sediment to the Lagoon. The LA calculated using the models represents the amount of ocean sediments coming from the ocean and depositing at the Lagoon mouth.

8.9 Summary of TMDL Results

The overall TMDL and its component loads are presented in Table ~~4~~6. Daily loads are established by dividing the modeled loads by the number of days (211 days) within the critical wet period (October 1, 1992–April 30, 1993). Year 2000 loads, historical loads, and required reductions are presented in Table ~~5~~7. Year 2000 loads were estimated based on modeling of year 2000 land-use conditions (from the SANDAG 2000 land-use coverage) and meteorological conditions from the critical wet period (October 1, 1992–April 30, 1993). As described in Section 4, the numeric targets were calculated based on modeling of historical (mid-1970s) land-use conditions and the same critical wet period meteorological data in order to accurately compare the watershed and Lagoon response to the same weather conditions. Historic loads define the allowable load; therefore, required load reductions represent the difference between year 2000 sediment loads and historic (allowable) loads.

Sediment dynamics within the Lagoon are dependent on a number of factors, including runoff volumes and the amount of sediment that is transported to the Lagoon from the watershed. These factors are important components in determining the timing and magnitude of erosion and depositional processes within the Lagoon. Modeling ~~The~~ Lagoon sediment dynamics ~~model~~ shows that ~~a~~ reduct~~i~~ngon ~~in~~ watershed sediment load~~s~~ing ~~affects~~ increases the amount of ocean sediments that ~~can~~ deposit throughout the Lagoon. ~~from oceanic inputs (considering the input of sediment from the ocean boundary under year 2000 and historical conditions is constant)~~. ~~The model analysis for~~

~~historical conditions indicates that a greater proportion of sediment that deposits in the Lagoon originates from tidal inputs during lower watershed loading periods; therefore,~~ Therefore, the TMDL results show reduced sediment deposition from tidal/oceanic input during the critical wet period under historical conditions because of complex lagoon deposition/erosion dynamics~~that a net decrease in oceanic loads occurs during the critical wet period under historical land-use conditions~~. This is likely explained by the hydrodynamic conditions within the watershed and Lagoon. The higher storm water flows (due to hydromodification) from the watershed under current conditions flushes ocean sediments from the mouth, whereas the lower storm water flows under historic conditions allows more ocean sediments to accumulate in the mouth.

To meet the TMDL, the total load reduction required from the watershed is approximately 67~~75~~ percent. Tidal input from the ocean boundary represents natural background loads; therefore, no reduction is required for this source category.

Table 6. TMDL summary

Source	Critical Wet Period Load (tons)	Daily Load (tons)
Watershed contribution (WLA)	2,580~~1,962~~	12.2~~9.3~~
Ocean boundary (LA)	9,780	46.4
Margin of Safety (MOS)	implicit~~618~~	implicit~~2.9~~
TMDL	12,360	58.6

Table ~~7~~75. Year 2000 vs. historical loads and percent reduction

Source	Year 2000 Load (tons)	Historical (mid-1970s) Load (tons)	Load Reduction (tons)	Percent Reduction Required
Watershed contribution (WLA)	7,719	2,580~~1,962~~	5,139~~757~~	67~~5~~%
Ocean boundary (LA)	5,944	9,780	+3,836 (increase)	+39% (increase)
Total	13,663	12,360	1,303	10%

8.10 Daily Load Expression

Load allocations are expressed in terms of net sediment load for the critical period (tons) because sediment delivery to streams is highly variable on a daily and annual basis. Loads were also divided by the number of days in the critical period (211 days) to derive daily loading rates (tons/mi^2/day). Because of the natural variability in sediment delivery rates, compliance with load allocations must be evaluated using a long-term, weighted rolling average.

8.11 Margin of Safety

A margin of safety (MOS) is incorporated into a TMDL to account for uncertainty in developing the relationship between pollutant discharges and water quality impacts ~~(US EPA, 1991)~~. For this TMDL, an ~~explicit~~ implicit MOS was included through application of conservative assumptions during selection of numeric targets and development of the implementation plan.

Conservative assumptions were applied when selecting the watershed numeric target. The following list describes several key assumptions that were used.

- **Critical condition** - The wet season that includes the 1993 El Nino storm events (10/1/92 – 4/30/93) was selected as the critical condition time period for TMDL development. This is one of the wettest periods on record over the past several decades. Because of the large amount of rainfall, sediment loads were significantly higher during this period than in other years with less rainfall.

- **Soil composition** - Soils that are more easily transported typically have higher proportions of smaller particles sizes (silt and clay fractions), as compared to local parent soils, because of differences in settling rates and other sediment transport characteristics. To account for these differences in the model, soils transported by surface runoff were assumed to be composed of 5 percent sand, twice as much clay as the percentage of clay within each hydrologic soil group, and the remainder assigned to the silt fraction.

- **Numeric target** - The historical analysis involved an extensive literature search and technical analysis in order to identify an appropriate time period for development of the numeric sediment target. This comprehensive 'weight of evidence' analysis considered all available information regarding urbanization and lagoon impacts over time in order to identify a conservative reference condition.

Conservative assumptions were applied when selecting the Lagoon numeric target. By selecting a Lagoon numeric target in addition to the watershed numeric target, assurance is provided that sediment discharged between the mid-1970s and the year 2000 will be accounted for. Furthermore, the Lagoon numeric target provides a direct assessment of Lagoon conditions relative to beneficial uses relative to the watershed loading target. ~~An explicit MOS of 5 percent was applied to account for the difficulty in collecting water samples that accurately compute sediment transport and the lack of available bank erosion and bedload transport data.~~

Lastly, conservative assumptions were employed in the implementation plan through outlining the adaptive management approach to be used in determine the acceptable

balance of sediment loading relative to progress in achieving and maintaining beneficial uses in the Lagoon and other factors.

8.12 Seasonality

The federal regulations at 40 CFR 130.7 require that TMDLs include seasonal variations. Sources of sediment are similar for both dry and wet weather seasons (the two general seasons in the San Diego region). Despite the similarity of wet/dry sources, transport mechanisms can vary between the two seasons. Throughout the TMDL monitoring period, the greatest transport of sediment occurred during rainfall events. Dry weather will contribute a deminimus discharge of sediment; however, model calibration and TMDL development focused on wet weather conditions because sediment transport is dramatically higher during wet weather. Model simulation was completed for the October 1, 1992–April 30, 1993 wet period to account for the much greater sediment loading and associated impacts to the Lagoon during this time period.

9 Implementation Plan

Los Peñasquitos Lagoon (Lagoon) is impaired for sedimentation/siltation, requiring the development of a TMDL and an implementation plan. The goal of the implementation plan is to ensure water quality objectives (WQOs) for sediment are met in the Lagoon. Consistent with California Water Code section 13242, this implementation plan describes the required actions by responsible parties, establishes a timeline, identifies interim milestones, and outlines monitoring objectives that will be used to assess the success of TMDL implementation.

As discussed in the source assessment and allocation sections of this TMDL, increased sediment discharge to the lagoon over time has contributed to sediment buildup and higher elevations that limit tidal flow and the extent of saltmarsh vegetation. This trend has resulted in impacts to beneficial uses, in particular, the estuarine and preservation of biological habitats of special significance beneficial uses. Watershed and lagoon numeric targets were identified to calculate the watershed sediment load reduction required based on historical analysis and to track implementation success. Reduced loading from storm water discharges and sediment removal in some areas may be needed to meet the requirements of this TMDL and to re-establish a more natural connection between the watershed, lagoon, and tidal flow.

Compliance with this sediment TMDL shall be based on achieving the Lagoon numeric target within the compliance timeframe. The responsible parties can implement a variety of implementation strategies, including preservation and restoration; education and outreach; retrofitting, new development, and site management; storm water BMP project construction and maintenance; and monitoring. Responsible parties are encouraged to work collaboratively to achieve the numeric targets and allocations specified in this TMDL.

This implementation section includes discussion of implementation actions needed to address this TMDL and describes an adaptive management framework that accounts for environmental and political complexities, as well as the time and financial resources needed to restore a coastal lagoon. This framework includes the following implementation processes:

1) Implement and evaluate the effectiveness of BMPs and source control strategies in conjunction with remediation actions to remove sediment as necessary;

2) Evaluate the effectiveness of controlling sediment loading from Carroll Canyon, Los Peñasquitos, and Carmel Creeks.

3) Conduct monitoring to inform decision making and to evaluate compliance during and after implementation actions are completed.

4) Re-evaluate the WLAs and LAs, if necessary.

5) Evaluate compliance with interim and final milestones.

9.1 Regulation by the San Diego Water Board

The Porter-Cologne Water Quality Control Act provides that "All discharges of waste into the waters of the State are privileges, not rights." Furthermore, all discharges are subject to regulation under the Porter-Cologne Act including both point and nonpoint source discharges.[1] In obligating the State Water Board and Regional Water Boards to address all discharges of waste that can affect water quality, the legislature provides the State Water Board and Regional Water Boards with authority in the form of administrative tools (waste discharge requirements [WDRs], waivers of WDRs, and Basin Plan waste discharge prohibitions) to address ongoing and proposed waste discharges. Hence, all current and proposed discharges must be regulated under WDRs, waivers of WDRs, a prohibition, or some combination of these or other administrative tools (e.g. Statewide Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program). Since the US EPA delegated responsibility to the State for implementation of the National Pollutant Discharge Elimination System (NPDES) program, WDRs for discharges to surface waters also serve as NPDES permits.

The regulatory mechanisms to implement the TMDL include, but are not limited to, general NPDES permits, individual NPDES permits, MS4 permits covering jurisdictions

[1] See Water Code sections 13260 and 13376.

and flood control districts within these waters, the Statewide Industrial Storm Water General Permit, the Statewide Construction Activity Storm Water General Permit, the Statewide Storm water Permit for Caltrans Activities, and the authority contained in Sections 13263, 13267 and 13383 of the Water Code. For each discharger assigned a WLA, the appropriate Order shall be reopened or amended when the order is reissued, in accordance with applicable laws, to incorporate the applicable WLA(s) as a permit requirement consistent with federal regulation and related guidance.[2]

9.2 Responsible Party Identification

Under this TMDL, the responsible parties are collectively assigned a single WLA, which they are responsible for meeting. An aggregate WLA allows for flexibility in achieving the load reduction required to meet the TMDL and improve Lagoon conditions. Responsible parties include: Phase I MS4 copermittees (the County of San Diego, City of San Diego, City of Del Mar, and the City of Poway), Phase II MS4 permittees, Caltrans, and the General Construction and General Industrial Storm Water NPDES permittees.

The San Diego Water Board encourages cooperation among all the responsible parties. While all the responsible parties in the Los Peñasquitos watershed must reduce their collective sediment load, the Phase I MS4 systems collect and drain virtually the entire watershed. As such, the Phase I MS4 copermittees represent the ultimate point source conveyor of sediment to the Lagoon. Therefore, it is the responsibility of the Phase I MS4 copermittees to assume the lead role in coordinating and carrying out the necessary actions, compliance monitoring requirements, and successful implementation of the adaptive management framework required as part of this TMDL.

Individual industrial facilities and construction sites are subject to regulation on two levels: (1) The San Diego Water Board is responsible for enforcing the statewide general industrial and construction storm water NPDES permits for sites within its jurisdiction.; and (2) each local municipality is responsible, under the MS4 storm water permit, for enforcing its own ordinances and permits (for violations of its ordinances/permits by an individual industrial facility or construction site within its jurisdiction). The San Diego Water Board is responsible for ensuring that the MS4 copermittees comply with specific MS4 permit requirements regarding the MS4 copermittees implementation of BMPs, such as inspections and ordinance enforcement, for construction and industrial sites within their jurisdiction.

[2] 40 CFR 144.22(d)(1)(vii)(B); US EPA Memorandum “Revisions to the November 22, 2002 Memorandum ‘Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs’” (November 12, 2010).

The San Diego Water Board relies upon the municipality to enforce its ordinances/permits and then works with the municipality to coordinate information and actions to compel compliance at the local and state level.

9.3 Phased Implementation via the Adaptive Management Approach

A common problem in natural resource management involves a temporal sequence of decisions (or implementation actions), in which the best action at each decision point depends on the state of the managed system. Adaptive management is a structured iterative implementation process that offers flexibility for responsible parties to monitor implementation actions, determine the success of such actions and ultimately, base future management decisions upon the measured results of completed implementation actions and the current state of the system. This process enhances the understanding and estimation of predicted outcomes and ensures refinement of necessary activities to better guarantee desirable results. In this way, understanding of the resource can be enhanced over time, and management can be improved.

Adaptive management entails applying the scientific method to the TMDL. A National Research Council review of US EPA's TMDL program strongly suggests that the key to improving the application of science in the TMDL program is to apply the scientific method to TMDL implementation (NRC 2001). For a TMDL, applying the scientific method involves 1) taking immediate actions commensurate with available information, 2) defining and implementing a program for refining the information on which the immediate actions are based, and 3) modifying actions as necessary based on new information. This approach allows the Lagoon to make progress toward attaining water quality standards while regulators and stakeholders improve the understanding of the system through research and observation of how it responds to the immediate actions.

Implementation actions to achieve the numeric targets will be implemented via an iterative process, whereby the information collected at each step will be used to inform the implementation of the next phase. The project will be adjusted, as necessary, based on the latest information collected to optimize the efficiency of implementation efforts. Ultimately, the path moving forward is to create the physical conditions related to remediating sediment impacts associated with this TMDL.

The implementation effort can be divided into three primary phases for this TMDL, as described below:

- Phase I Implementation includes elements to reduce the amount of sediment that is transported from the watershed to the Lagoon. An important component of Phase I will be to secure the relationships and agreements between cooperating parties and to develop a detailed scope of work with priorities.

  Phase I includes the following elements:
  - Incorporate interim limits into WDRs and NPDES permits;
  - Implement structural and nonstructural BMPs throughout the watershed; and
  - Develop and initiate a comprehensive monitoring program, which includes compliance monitoring and targeted special studies.

  If appropriate, the TMDL will be reconsidered by the San Diego Water Board at the end of Phase I to consider completed special studies or policy changes (see section 9.7).

- Phase II includes the implementation of additional watershed actions that are targeted to reduc~~ing~~e sediment loads from high priority areas, as well as lagoon-specific actions that may be needed to facilitate recovery of beneficial uses that have been affected by various complex processes, including sedimentation, nuisance flows, reduced tidal circulation, and other factors. These actions may include Lagoon sediment remediation efforts, re-connecting the Lagoon's historic tidal channels, and maintenance of the Lagoon inlet in collaboration with State Parks, the San Diego Water Board, the Los Angeles-San Diego-San Luis Obispo (LOSSAN) Rail Corridor Agency, US EPA, and the watershed responsible parties. Phase II may also include additional upstream protections and BMP implementation to further reduce watershed sediment contributions. Responsible parties will develop, prioritize, and implement Phase II elements based on data from compliance monitoring and special studies.

- Phase III includes implementation of secondary and additional remediation actions, as necessary, to be in compliance with this TMDL.

9.4 Develop and Submit a Load Reduction Plan

Responsible parties are required to prepare and submit for San Diego Water Board review, comment, and revision, a Load Reduction Plan that demonstrates how they will comply with this TMDL. The San Diego Water Board expects that Load Reduction Plans will be developed collaboratively by the responsible parties within the watershed. The Load Reduction Plan shall be submitted to the San Diego Water Board within 1~~8~~2 months of the TMDL effective date, and reviewed by the San Diego Water Board Executive Officer within six months of submittal (this period will likely include a round of revisions by the responsible parties based on San Diego Water Board staff comments).

The Load Reduction Plan shall establish a watershed-wide, programmatic, adaptive management approach for implementation and include a detailed description of implementation actions, identified and planned by the responsible parties, to meet the requirements of this TMDL. Implementation actions identified by the Load Reduction Plan may include source control techniques, structural and/or non-structural storm water BMPs, and/or special studies that refine the understanding of sediment and pollutant sources within the watershed. The Load Reduction Plan shall include a description and objective of each implementation action, potential BMP locations, a timeline for project or BMP completion, and a monitoring plan to measure the effectiveness of implementation actions.

Storm Water Pollution Prevention Plans (SWPPPs) prepared by Phase II MS4s, Industrial Permittees, and Construction Permittees pursuant to their respective statewide general NPDES permits fulfill these entities responsibility to prepare a Load Reduction Plan. Permittees within the Los Peñasquitos watershed shall update their SWPPPs within 12 months of the TMDL effective date with any additional BMPs, monitoring, etc. to account for their site's potential to impact the receiving waterbody with respect to sediment. Sites identified through monitoring data or site inspections as posing an increased risk to the receiving water body may be directed to perform additional monitoring by the San Diego Water Board Executive Officer to quantify sediment load contributions to the receiving waterbody.

9.4.1 Comprehensive Approach

The comprehensive approach to the Load Reduction Plan requires that implementation efforts address all current TMDLs, current 303(d) listed waterbody/pollutant combinations, and other targeted impairments within the Los Peñasquitos watershed. A comprehensive approach to the Load Reduction Plan is consistent with implementation planning currently underway to address all of the impaired segments that were included in the approved bacteria TMDLs for San Diego Region Beaches and Creeks (San Diego Water Board, 2010).

The comprehensive approach to the Load Reduction Plan allows the responsible parties to proactively address other listed impairments within the watershed, which requires special studies to investigate sources and the water quality improvements needed to address these pollutants. Such special studies (discussed in more detail below) may significantly alter current understanding and refine the TMDL loading and/or allocations. This can impact the selection of subsequent implementation actions and how they are prioritized by responsible parties. A comprehensive approach to development of the Load Reduction Plan will provide a more cost effective and efficient approach for TMDL implementation and will have fewer potential environmental impacts associated with construction of structural BMPs (San Diego Water Board, 2010).

9.4.2 Load Reduction Plan Framework

With increased ~~urban~~ land development and inadequate management of runoff from impervious areas, increasing amounts of sediment are deposited into the Lagoon annually. To minimize the effects of runoff, proper sediment control can be achieved through the execution of implementation actions such as BMPs. Sediment implementation actions can be grouped into four categories: preservation and restoration, education and outreach, retrofitting, new development, and site management, and monitoring. Proposed activities presented in the Load Reduction Plan may be grouped into these categories, each is summarized below.

1) **Preservation and Restoration:** Significant areas of land have been set aside for open space. Such land acquisition and preservation prevents natural areas from being developed and disturbed. Additionally, the restoration of riparian buffers and wetlands can include the stabilization of steep slopes with native riparian vegetation. This not only helps restore the habitat but also the natural function of the stream.

2) **Education & Outreach:** As a source control technique, education and outreach can function as pollution prevention to reduce or eliminate the amount of sediment generated at its source. Education and outreach can be targeted at specific land user groups and/or staff involved with site maintenance. As an example, implementation actions such as municipal incentives can be used to encourage proper irrigation and landscaping and can significantly reduce volumes of runoff.

3) **Retrofitting, New Development, & Site Management:** ~~Urban~~ Land development (MS4 contribution) is the primary source of anthropogenic sediment contribution above historical conditions. Development can expose sediment and contribute excessive amounts of sediment to the Lagoon. Additionally, increased imperviousness associated with development can lead to increased storm water runoff and soil erosion or gullying within the MS4 and receiving waters. Appropriate site management can partially or fully mitigate the effects of development. The Load Reduction Plan must identify and prioritize BMPs based on an analysis of opportunities and cost/benefit considerations. Furthermore, the Load Reduction Plan must detail BMP projects and locations. Storm water BMPs can be implemented to reduce the effects of pollutant loading and increased storm water flows from ~~urban~~ development. Structural BMPs include incorporation of low impact development (LID) and storm flow hydrograph matching into new projects. The same structural BMPs can be utilized to retrofit existing sites or be applied as regional MS4 BMPs to treat pollutants and/or flows prior to discharge into receiving waters.

4) **Monitoring:** A coordinated monitoring plan is needed to establish existing watershed conditions (baseline conditions) from which future changes and anticipated improvement in water quality can be measured. Additional monitoring could focus on sensitive species, areas of saltmarsh coverage, extent of invasive plant species, BMP effectiveness, in-stream hydromodification, and/or reduction in impervious coverage. Additionally, monitoring is crucial in the assessment of implementation actions to gain an understanding of performance for future adaptive management actions.

9.5 Load Reduction Plan Implementation

The Load Reduction Plan must be implemented within ~~30~~ 90 days upon receipt of San Diego Water Board comments and recommendation, but in any event, no later than ~~60 days~~6 months after submittal.

9.6 Monitoring

Monitoring is required to measure the progress of pollutant load reductions and improvements in water and saltmarsh habitat acreage. The information presented in this section is intended to be a brief overview of the goals of the monitoring. Special studies may be planned to improve understanding of key aspects related to achievement of WLAs, LAs, and numeric targets, restore the beneficial uses, and to assist in the modification of structural and non-structural BMPs if necessary.

The goals of monitoring include:

1) To determine compliance with the assigned wasteload and load allocations.

2) To monitor the effect of implementation actions proposed by responsible parties to improve water and saltmarsh habitat quality including proposed structural and non-structural BMPs to reduce storm water run-off and sediment loading, and remediation actions to remove sediment from the Lagoon.

3) To monitor the extent of vegetation habitat acreages in the Lagoon and determine if additional implementation action should be required.

4) To implement the monitoring in a manner consistent with other TMDL implementation plans and regulatory actions within the Los Peñasquitos watershed.

The proposed monitoring program shall be included in the Load Reduction Plan submitted to the San Diego Water Board Executive Officer for review.

Monitoring shall be conducted under technically appropriate Monitoring and Reporting Plans (MRPs) and Quality Assurance Project Plans (QAPPs). The MRPs shall include a requirement that the responsible parties report compliance and non-compliance with interim milestones as part of annual reports submitted to the San Diego Water Board. The QAPPs shall include protocols for sample collection, standard analytical procedures, and laboratory certification. All samples shall be collected in accordance with SWAMP protocols. The monitoring program must establish the following elements:

1) Specification of the constituents, sample locations and frequency of monitoring.

2) The types of monitoring techniques to be used.

3) The standard operating procedures and appropriate quality assurance protocols.

4) Analytical techniques and objectives for the interpretation and analysis of information gathered.

5) A process for refining and modifying the monitoring design in response to changing objectives and improved information.

6) A designated laboratory with sufficient capacity and appropriate levels of certification.

The San Diego Water Board Executive Officer may reduce, increase, or modify monitoring and reporting requirements, as necessary, based on the results of the TMDL monitoring program.

9.6.1 Watershed Monitoring

Responsible parties must conduct suspended sediment, bedload, and flow monitoring to calculate total sediment loading to the Lagoon for each wet period (October 1 thru April 30) throughout the 20-year compliance period. The responsible parties must monitor enough storm events throughout to quantify total annual sediment loading over each wet period. The compliance point for the WLA shall be the Lagoon as measured through the cumulative sediment loading from Los Peñasquitos, Carroll Canyon, and Carmel Creeks prior to entering the Lagoon. The responsible parties must monitor as many stations as necessary to quantify sediment loading to the Lagoon. Because of the natural variability in sediment delivery rates, sediment loading shall be evaluated using a 3-year, weighted rolling average. The first average must be calculated following the third critical wet period after the TMDL effective date.

Responsible parties are encouraged to collaborate or coordinate their efforts with other regional and local monitoring programs to avoid duplication and reduce associated costs.

In addition to the TMDL constituents identified above, the responsible parties should consider conducting general water chemistry (temperature, dissolved oxygen, pH, and electrical conductivity) at each sampling event. General chemistry measurements may be taken in the laboratory immediately following sample collection if auto samplers are used for sample collection or if weather conditions are unsuitable for field measurements.

9.6.2 Lagoon Monitoring

The responsible parties shall monitor the Lagoon ~~monitored~~ annually in the fall for changes in extent of the vegetation types. Lagoon monitoring shall be consistent with the methodology used to calculate the numeric target described in Section 7.4. Aerial photos of the Lagoon must be acquired, digitized onscreen (at an approximate 1:2,500 scale), interpreted, and mapped into generalized classifications. Vegetation types must be classified as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh – *Lolium perrene* infested, freshwater marsh, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover (urban, beach, dune, upland vegetation, etc.). Vegetation type classifications are described in Section 7.4. Ground truthing may be performed after aerial photo interpretation to distinguish between vegetation types.

9.7 Reconsiderations

Special studies may be used to refine source assessments, assign appropriate allocation based on updated information from the results of implementation actions and the monitoring program, and help focus implementation efforts. San Diego Water Board staff also recognize that the TMDL targets, allocations, and proposed implementation actions to reach those targets and allocations may change. The results of special studies submitted to the San Diego Water Board's Executive Officer will be considered during subsequent TMDL reopeners. In addition, it may be necessary to make adjustments to the TMDL to be responsive to new State policies and other regulations.

If appropriate, the TMDL will be reconsidered by the San Diego Water Board at the end of Phase I to consider completed special studies or policy changes.

The responsible parties always have the option to propose new numeric targets or a revised compliance schedule, with adequate support, to reopen the TMDL.

As the implementation of this TMDL progresses, the San Diego Water Board recognizes that revisions to the TMDL, WLA, LA, numeric targets, implementation plan, and potentially to beneficial uses and water quality objectives may be necessary in the future. Any future revisions to the Basin Plan necessary to implement this TMDL will require a Basin Plan amendment.

Revisions to the Basin Plan typically require substantial evidence and supporting documentation to initiate the Basin Plan amendment process. Given the severely limited resources available to the San Diego Water Board for developing Basin Plan amendment projects, developing the evidence and documentation to initiate a Basin Plan amendment will be the responsibility of the dischargers and/or other parties interested in amending the requirements or provisions implementing this TMDL.

The San Diego Water Board will initiate a Basin Plan amendment project to revise the requirements and/or provisions for implementing this TMDL (including, but not limited to, the TMDL, WLA, LA, numeric targets, implementation plan) if all the following conditions are met:

- Sufficient data are collected to provide the basis for the Basin Plan amendment.
- A report is submitted to the San Diego Water Board documenting the findings from the collected data.
- A request is submitted to the San Diego Water Board with specific revisions proposed to the Basin Plan, and the documentation supporting such revisions.
- TMDL revision is consistent with Basin Plan review priorities.

The San Diego Water Board will work with the project proponents to ensure that the data and documentation will be adequate for the initiation of the Basin Plan amendment. The San Diego Water Board will be responsible for taking the Basin Plan amendment project through the administrative and regulatory processes for adoption by the San Diego Water Board, and approval by the State Water Board, Office of Administrative Law, and US EPA.

9.8 Compliance Schedule and Determination

9.8.1 Compliance Schedule

As discussed above, the implementation schedule for this TMDL follows the form of an adaptive management strategy, tracks implementation progress with established milestones or interim goals, and sets forth a final compliance date. It is impractical for land managers to actually measure sediment loading on a daily basis; thus, compliance with the TMDL is most appropriately expressed as an average annual load and should be evaluated as a long-term running average to account for natural fluctuations and inaccuracies in estimating sediment loads.

The expected timeframe to achieve the required reduction in sediment loading is 20 years following TMDL approval. This timeline takes into consideration the planning needs of the responsible parties and other stakeholders to establish a Load Reduction Plan, time needed to address multiple impairments, and provides adequate time to measure temporal disparities between reductions in upland loading and the corresponding Lagoon water quality response.

Current studies and other implementation actions or projects are already underway to reduce sediment loading to the Lagoon and to gain a better understanding of source contributions. A variety of such projects will continue throughout the development of the Load Reduction Plan, ensuring there are no gaps in implementation efforts throughout the process.

At the end of the TMDL compliance schedule, as outlined in Table ~~8~~6, waters must meet the Lagoon's sediment water quality standard and therefore, the Lagoon numeric target. If at any point during the implementation plan, monitoring data or special studies indicate that WLA will be attained but the Lagoon numeric target may not be achieved, the San Diego Water Board shall reconsider the TMDL to modify WLA to ensure that the Lagoon numeric target is attained.

Table ~~8~~86. Implementation compliance schedule.

Item	Implementation Action	Responsible Party	Date
1	Obtain approval by OAL of Los Peñasquitos Lagoon Sediment TMDL = Establishes effective date of TMDL	San Diego Water Board, San Diego County, City of San Diego, City of Poway, City of Del Mar, Caltrans, General Storm Industrial and Construction permittees	Estimated June 2013
2a	Issue, reissue, or revise general WDRs and NPDES requirements for Phase I MS4s, including Caltrans, to incorporate requirements for complying with TMDL and WLAs	San Diego Water Board and State Water Board	Completed during permit renewal - within 5 years of applicable permit date, and every 5 years thereafter.
2b	Issue, reissue, or revise general WDRs and NPDES requirements for Construction and Industrial NPDES to incorporate requirements for complying with TMDL and WLAs	San Diego Water Board and State Water Board	Completed during permit renewal - within 5 years of applicable permit date, and every 5 years thereafter.
2c	Issue, reissue, or revise general WDRs and NPDES requirements for Phase II	San Diego Water Board and State Water Board	Completed during permit renewal - within 5 years of applicable

Item	Implementation Action	Responsible Party	Date
	NPDES permittees to incorporate requirements for complying with TMDL and WLAs		permit date, and every 5 years thereafter.
3a	Completion of Load Reduction Plans	Phase 1 MS4s and Caltrans	Within 18~~2~~ months of OAL effective date for sediment TMDL
3b	Approval of Load Reduction Plan	San Diego Water Board Executive Officer	Within 6 months of submittal
3c	Phased, adaptive implementation of Load Reduction Plan	Phase 1 MS4s and Caltrans	In accordance with Load Reduction Strategy – ongoing throughout the implementation
3d	Revision of SWPPPs	Construction, ~~i~~industrial, and Phase II Permittees	Within 12 months of OAL effective date for sediment TMDL
4a	Submit annual Progress Report to the San Diego Water Board due January 31 each year	Phase 1 MS4s	Annually after reissuance of NPDES WDR
4b	Submit annual Progress Report to the San Diego Water Board due April 1 each year	Caltrans	Annually after reissuance of NPDES WDR
5	Enforcement Actions	San Diego Water Board	As needed
6	Refine Load Reduction Plan	Phase 1 MS4s and Caltrans	As warranted by completion of special studies, additional monitoring and data compilation.
7	Reopen and reconsider TMDL	San Diego Water Board	As defensible through the collection of additional data and significant findings by the watershed stakeholders.

Item	Implementation Action	Responsible Party	Date
8	Meet Interim Milestone #1: Attain 20 percent required reduction in sediment loading (equivalent to 6691~~6567~~ tons of sediment per year) and/or show progress in improving Lagoon conditions consistent with the specified targets	MS4s and NPDES permittees	Within 5 years of approved TMDL
9	Meet Interim Milestone #2: Attain 40 percent required reduction in sediment loading (equivalent to 5663~~5416~~ tons of sediment per year) and/or show progress in improving Lagoon conditions consistent with the specified targets	MS4s and NPDES permittees	Within 9 years of approved TMDL
10	Meet Interim Milestone #3: Attain 60 percent required reduction in sediment loading (equivalent to 4636~~4265~~ tons of sediment per year) and/or show progress in improving Lagoon conditions consistent with the specified targets	MS4s and NPDES permittees	Within 13 years of approved TMDL
11	Meet Interim Milestone #4: Attain 80 percent required reduction in sediment loading (equivalent to 3608~~3113~~ tons of sediment per year) and/or show progress in improving Lagoon conditions consistent with the specified targets	MS4s and NPDES permittees	Within 15 years of approved TMDL
12	Meet Final Milestone: Achieve Lagoon numeric target	MS4s and NPDES permittees	Within 20 years of approved TMDL

**Note: TMDL implementation schedule may be altered due to TMDL reconsideration; additionally, enforcement actions by the San Diego Water Board will be taken as necessary.*

9.8.2 Compliance for Phase I MS4s and Caltrans

~~The goal of the TMDL is to achieve the Lagoon's sediment water quality standard through restoration of all of the Lagoon's beneficial uses and attainment of the sediment water quality objective.~~ The TMDL is achieved and thus t~~T~~he sediment water quality standard is attained when the Lagoon numeric target is met. If the Lagoon numeric target is not met, the responsible parties must demonstrate they have 1) complied with the WLA and 2) addressed historical sediment discharged to the Lagoon since the 1970s that the responsible parties caused or contributed to. Responsible parties can address the discharges of historical sediment in numerous ways including, but not limited to, Lagoon restoration activities and monitored natural reduction of sediment in the Lagoon. Monitored natural reduction of sediment refers to the reliance on natural processes to achieve site-specific restoration objectives within a time frame that is reasonable compared to that offered by other more active methods. Compliance is assessed through special studies and monitoring of the Lagoon and its contributing watershed.

Compliance with interim milestones shall be assessed based on each party's ability to demonstrate that it has complied with the interim milestones. Since sediment transport can vary immensely between wet and dry years, compliance with interim targets shall be achieved if the responsible parties can demonstrate that they have 1) shown progress in improving Lagoon conditions consistent with the Lagoon numeric target and/or 2) achieved the sediment load reductions outlined in Table 8~~6~~. Progress can be demonstrated through monitoring and reporting on implementation actions achieved as outlined in the Load Reduction Plan, implementation action successes, and/or improvements in saltmarsh and non-tidal saltmarsh habitat. For other measures to be considered, they must be described in the Load Reduction Plan and be accompanied by a monitoring plan to measure progress.

9.8.3 Compliance for Phase II MS4s, Construction Permittees, and Industrial Permittees

Phase II MS4s, Construction, and Industrial NPDES Permittees are assumed to be in compliance with the TMDL and their contribution to the total WLA if they are enrolled and in compliance with their respective general statewide permit, and are found to not contribute to the sediment impairment in the Lagoon through monitoring data and/or inspections. The San Diego Water Board may direct individual Permittees under the Phase II MS4, Construction, and Industrial general storm water NPDES permits to obtain an Individual NPDES permit for their storm water discharges. Direction by the San Diego Water Board to obtain an individual NPDES permit may occur based upon program audits, state or local compliance inspections, and/or Permittee monitoring.

As discussed in Section 9.2 above, it is the responsibility of the Phase I MS4 copermittees to assume the lead role in coordinating and carrying out the necessary actions, monitoring requirements, and successful implementation of the adaptive management framework required as part of this TMDL. The San Diego Water Board relies upon the Phase I MS4s to enforce its ordinances/permits and then work with the San Diego Water Board to coordinate information and actions to compel compliance. The San Diego Water Board shall consider enforcement actions, as necessary, to control the discharge of sediment to any receiving waterbody that ultimately impairs the Lagoon to attain compliance with the sediment WLA specified in this TMDL.

10 Necessity of Regulatory Provisions

The Office of Administrative Law (OAL) is responsible for reviewing administrative regulations proposed by State agencies for compliance with standards set forth in California's Administrative Procedure Act, Government Code section 11340 *et seq*., for transmitting these regulations to the Secretary of State and for publishing regulations in the California Code of Regulations. Following State Water Board approval of this Basin Plan amendment establishing a TMDL, any regulatory portions of the amendment must be approved by the OAL per Government Code section 11352. The State Water Board must include in its submittal to the OAL a summary of the necessity for the regulatory provision. "Necessity" means the record of the rulemaking proceeding demonstrates by substantial evidence the need for a regulation to effectuate the purpose of the statute, court decision, provision of law that the regulation implements, interprets, or makes, taking into account the totality of the record. For purposes of this standard, evidence includes, but is not limited to, facts, studies, and expert opinion [Government Code section 11349(a)].

This Basin Plan amendment for sediment impairment of the Los Peñasquitos Lagoon meets the “necessity standard” of Government Code section 11353(b). Amendment of the Basin Plan to establish and implement the sediment TMDL for the Los Peñasquitos Lagoon is necessary because the existing water quality does not meet the applicable narrative sediment WQOs. Applicable State and federal laws require the adoption of this Basin Plan amendment and regulations as provided below.

The State Water Board and Regional Water Boards are delegated the responsibility for implementing the California Water Code and the federal CWA. Pursuant to relevant provisions of both, the State Water Board and Regional Water Boards establish water quality standards, including designated (beneficial) uses and criteria or objectives to protect those uses.

Section 303(d) of the CWA [33 USC section 1313(d)] requires the states to identify certain waters within its borders that are not attaining water quality standards and to establish TMDLs for the pollutants impairing those waters. US EPA regulations [40 CFR 130.2] provide that a TMDL is a numerical calculation of the amount of a pollutant that a water body can assimilate and still meet standards. A TMDL includes one or more numeric targets that represent attainment of the applicable standard, considering seasonal variations, a margin of safety, and load allocations. TMDLs established for impaired waters must be submitted to the US EPA for approval.

CWA section 303(e) requires that TMDLs, upon US EPA approval, be incorporated into the state's Water Quality Management Plans, along with adequate measures to implement all aspects of the TMDL. In California, these are the basin plans for the nine regions. Water Code sections 13050(j) and 13242 require that basin plans have a program of implementation to achieve WQOs. The implementation program must include a description of actions that are necessary to achieve the objectives, a time schedule for these actions, and a description of surveillance to determine compliance with the objectives. California law requires that a TMDL project include an implementation plan because TMDLs normally are, in essence, interpretations or refinements of existing WQOs. The TMDL has to be incorporated into the region's basin plan [CWA section 303(e)] because the TMDL supplements, interprets, or refines an existing objective.

11 Public Participation

Public participation is an important component of TMDL development. Federal regulations [40 CFR 130.7] require that TMDL projects be subject to public review. All public hearings and public meetings have been conducted as stipulated in the regulations [40 CFR 25.5 and 25.6] for all programs under the CWA. Public participation was provided through one public workshop and through the formation and participation of the third party ~~S~~stakeholder ~~Advisory G~~group, which met at least monthly between April 2009 and June 2011, and additionally thereafter as needed to discuss technical issues and review draft documents. In addition, staff contact information was provided on the San Diego Water Board's website, along with periodically updated drafts of the TMDL project documents. Public participation also took place through the San Diego Water Board's Basin Plan amendment process, which included a hearing and two formal public comment periods. Public comments from the first formal public comment period are available in Attachment 5. A chronology of public participation and major milestones is provided in Table 9 ~~Table 7~~.

Table ~~9~~9~~7~~. Public participation milestones

Date	Event
February 15, 2011	Public Workshop and CEQA Scoping Meeting
April 22, 2011	Draft Documents released for public review
February 15, 2012	Revised Draft Documents released for public review
May 9, 2012	Public Hearing and Adoption

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Attachment 3

Environmental Analysis and Checklist

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ATTACHMENT 3: ENVIRONMENTAL ANALYSIS AND CHECKLIST

Contents of this Attachment

3.1 Purpose and Objectives of the Basin Plan Amendment Project

Los Peñasquitos Lagoon (Lagoon) is designated by US Environmental Protection Agency (US EPA), under Section 303(d) of the federal Clean Water Act, as impaired by sediment. Sediment in the lagoon compromises designated beneficial uses, including contact water recreation; non-contact water recreation; biological habitats of special significance; estuarine habitat; wildlife habitat; rare, threatened or endangered species; marine habitat; migration of aquatic organisms; fish spawning, reproduction and/or early development; and shellfish harvesting.

The Project under consideration is the adoption of an amendment to the *Water Quality Control Plan for the San Diego Basin* (Basin Plan) incorporating a total maximum daily load (TMDL) for sediment in Lagoon.

The purpose of the Basin Plan amendment project is to attain the water quality standard for sediment that will protect all uses. This will require dischargers of sediment to meet numeric sediment reduction targets, as stated in the Sediment TMDL for Los Peñasquitos Lagoon Draft Staff Report (Draft Staff Report).

3.2 California Environmental Quality Act Requirements

The basic purposes of the California Environmental Quality Act (CEQA) are to: 1) inform decision makers and the public about potential significant environmental effects of a proposed project and give them opportunities to comment to the lead agency, 2) identify ways that environmental damage may be mitigated, 3) prevent significant,

avoidable damage to the environment by requiring changes in projects, through the use of implementation alternatives or mitigation measures when feasible, and 4) disclose to the public why an agency approved a project if significant effects may occur.[1]

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) must comply with the CEQA when amending the Basin Plan as proposed in this project. Under CEQA, the San Diego Water Board is the Lead Agency for evaluating potential environmental impacts of the proposed project.

Adoption of a Basin Plan amendment is an activity subject to CEQA requirements because Basin Plan amendments constitute rules or regulations requiring the installation of pollution control equipment, establishing a performance standard, or establishing a treatment requirement.[2] Sections 3.2.1 and 3.2.2 below describe in detail the statutory requirements and scope of this environmental analysis required by CEQA for adoption of Basin Plan amendments and water quality standards.

This TMDL Basin Plan amendment (TMDL) contains numeric targets designed to meet the narrative water quality objective for sediment and restore the beneficial uses in the Lagoon. The TMDL also includes wasteload allocations for point sources and load allocations for nonpoint sources and natural background. The numeric targets, together with the allocations, may be considered a new performance standard.[3] Because development of a performance standard does not constitute development of a new water quality objective, but rather implements existing objectives to protect beneficial uses, the San Diego Water Board is not required to consider the factors in Water Code section 13241 (a) through (f).

3.2.1 Exemption from Requirement to Prepare Standard CEQA Documents

CEQA authorizes the Secretary for Natural Resources to certify State regulatory programs designed to meet the goals of CEQA as exempt from requirements to prepare an Environmental Impact Report (EIR), Negative Declaration, or Initial Study. The Water Boards' Basin Plan amendment process is a certified regulatory program and is therefore exempt from CEQA's requirements to prepare such documents.[4] As such, the "substitute environmental documents" that support the San Diego Water Board's proposed basin planning action contain the required environmental documentation under CEQA.[5] The substitute environmental documents (SED) include the environmental checklist, the detailed Staff Report, peer review and public comments and responses to comments, this resolution, and the Basin Plan Amendment.

[1] 14 CCR section 15002(a)
[2] 14 CCR section 15187 (a) and Public Resources Code sections 21159-21159.4.
[3] The term "performance standard" is defined in the rulemaking provisions of the Administrative Procedure Act [Government Code sections 11340-l 1359]. A "performance standard" is a regulation that describes an objective with the criteria stated for achieving the objective [Government Code section 11342(d)].
[4] 14 CCR section 15251(g) and Public Resources Code section 21080.5.
[5] 23 CCR section 3777

3.2.2 Scope of Environmental Analysis

The State Water Board's CEQA implementation regulations[6] describe the substitute environmental documents (SED) required for Basin Plan amendment actions. For this project, those documents include the Draft Staff Report, the draft Basin Plan amendment, and the environmental analyses contained in this Appendix. Specifically, these analyses include:[7]

1. A brief description of the proposed project, including a description of the environmental setting. In this case, the proposed project is the Basin Plan amendment adopting the Sediment TMDL for Los Peñasquitos Lagoon. This amendment is described in Section 3.3 of this attachment.

2. Identification of reasonably foreseeable environmental impacts of the proposed project (Section 3.7).

3. Reasonable alternatives to the proposed project and mitigation measures to avoid or reduce any significant or potentially significant adverse environmental impacts (discussed in Section 3.7 and 3.9).

4. An analysis of reasonably foreseeable methods of compliance. The analysis includes:

    a. Identification of reasonably foreseeable methods of compliance with the project (Section 3.6);
    b. A completed Environmental Checklist, with analysis of reasonably foreseeable significant adverse environmental impacts associated with those methods of compliance (Section 3.7);
    c. An analysis of reasonably foreseeable alternative means of compliance, which would have less significant adverse environmental impacts (Section 3.9); and
    d. An analysis of reasonably foreseeable mitigation measures that would minimize any unavoidable environmental impacts of the reasonably foreseeable methods of compliance (Section 3.7).

[6] 23 CCR section 3720 et seq. "Regulations for Implementation of the Environmental Quality Act of 1970."
[7] 23 CCR section 3777

Additionally, the environmental analysis takes into account a reasonable range of:[8]

- Environmental factors
- Economic factors
- Technical factors
- Population
- Geographic areas
- Specific sites

A "reasonable range" does not require an examination of every site, but a reasonably representative sample of the sites. The CEQA statute specifically states that the agency shall not conduct a "project level analysis."[9] Rather, a project level analysis must be performed by the responsible parties that are required to implement the TMDLs.[10] Actual environmental impacts will necessarily depend upon the compliance strategy selected by the responsible parties identified in the Staff Report. If not properly implemented or mitigated at the project level, there could be adverse environmental impacts from implementing this TMDL.

The SED identifies broad mitigation approaches that could be considered at the project level. Consistent with CEQA, the analysis in the SED does not engage in speculation or conjecture, but rather considers reasonably foreseeable environmental impacts of reasonably foreseeable methods of compliance, reasonably foreseeable mitigation measures, and reasonably foreseeable alternative means of compliance that would avoid, eliminate, or reduce the identified impacts. In preparing this environmental analysis, the San Diego Water Board has considered the pertinent requirements of state law,[11] and intends this analysis to serve as a program level environmental review.[12]

3.3 Project Description

As stated in Section 3.1 above, the project is adoption of an amendment to the San Diego Water Board's Basin Plan, incorporating a sediment TMDL for the Lagoon and an implementation plan to achieve the TMDL. As the San Diego Water Board's master planning document for water quality enhancement, restoration, and protection, the Basin Plan establishes the regulatory framework requiring actions that will reduce sediment inputs to the Lagoon to levels that will support the Lagoon's beneficial uses.

3.3.1 Environmental Setting

The Los Peñasquitos watershed is located in central San Diego County. Along with the Lagoon, the entire watershed is included in the Peñasquitos Hydrologic Unit (906), which also includes Mission Bay and several coastal tributaries. The Peñasquitos watershed includes portions of the following jurisdictions: City of San Diego, the City of

[8] 23 CCR section 3777(c); 14 CCR section 15187(d)
[9] Public Resources Code section 21159(d)
[10] Public Resources Code section 21159.2
[11] Public Resources Code section 21159 and 14 CCR section 15187
[12] 14 CCR section 15152; 14 CCR section 15168

Poway, the City of Del Mar, and San Diego County. Approximately 54 percent of the Peñasquitos watershed has been developed (e.g., low density residential, industrial/transportation, and commercial institutional land uses), with 46 percent of that area classified as impervious according to San Diego Association of Governments 2000 land use coverage. The largest single land use type in the Peñasquitos watershed is open space. A map of the watershed can be found in Section 3 of the Staff Report.

The watershed extends approximately 19 miles east, rising to an elevation of 2,600 feet above sea level. Los Peñasquitos, Carroll Canyon, and Carmel Creeks constitute the three sub-watersheds.

Freshwater drains from the 93 square mile Los Peñasquitos watershed into the Lagoon. The Lagoon is a 0.6 square mile coastal salt marsh lagoon located in Torrey Pines State Park. The Lagoon is designated as a "State Preserve," a label reserved for the rarest and most fragile state-owned lands. The Lagoon was formed when sea levels rose and flooded the young Los Peñasquitos River to form a deep embayment, which has filled with sediment over the millennia. Under present conditions, a permanent mouth opening to the ocean cannot be naturally maintained, except during exceptionally wet winters; therefore, the channel is often mechanically dredged to alleviate the danger of flooding and to improve the health of the Lagoon. Mouth closures are typically caused by coastal processes (deposition of sand and cobbles due to storms surges and wave action) and structures, such as the US Highway 101 abutments and railroad trestles.

The Lagoon is listed on the 2010 Clean Water Act section 303(d) list as impaired for sedimentation/siltation.[13] Los Peñasquitos Creek, a Lagoon tributary, is listed as impaired by enterococcus, fecal coliform, selenium, total dissolved solids, total nitrogen as N, and toxicity.

The Lagoon and its contributing watershed support a variety of sensitive species (state or federal endangered, threatened, candidate, or species of special concern). Important resources in this area include saltmarsh, coastal sage scrub and southern maritime chaparral. Furthermore, the San Diego Multiple Species Conservation Program identifies multiple covered species within the Peñasquitos watershed including San Diego thorn-mint, Shaw's agave, Del Mar manzanita, Encinitas baccharis, Orcutt's brodiaea, wart-stemmed ceanothus, short-leaved dudleya, variegated dudleya, San Diego button-celery, San Diego barrel cactus, willowy monardella, San Diego goldenstar, Torrey pine, San Diego mesa mint, Riverside fairy shrimp, southwestern pond turtle, San Diego horned lizard, orange-throated whiptail, California brown pelican, white-faced ibis, Canada goose, northern harrier, Cooper's hawk, golden eagle, western snowy plover, California least tern, burrowing owl, coastal cactus wren, California gnatcatcher, California rufous-crowned sparrow, Belding's savannah sparrow, grasshopper sparrow, mountain lion and mule deer. (City of San Diego, 1997)

[13] 2010 Integrated Report – Clean Water Act Section 303(d) List and 305(b) Report. Available at: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml

The climate in coastal San Diego County is generally mild. Annual temperatures average 65°F near the ocean. Average annual rainfall ranges from nine to eleven inches along the coast. There are three distinct seasons in the region: summer dry, winter dry, and winter wet weather. The winter wet weather season accounts for 85 to 90 percent of the annual rainfall.

3.3.2 Existing Local, Specific, and Regional Plans and Habitat Conservation Plans

Multiple Species Conservation Program

The entire Peñasquitos watershed lies within the San Diego Multiple Species Conservation Program (MSCP) Plan. The City of San Diego, City of Del Mar, City of Poway, and County of San Diego implement their respective portions of the MSCP Plan through subarea plans, which describe specific implementing mechanisms for the MSCP. The majority of the Peñasquitos watershed lies within the City of San Diego MSCP Subarea Plan.

The MSCP is a comprehensive, long-term habitat conservation plan that addresses the needs of multiple covered species and the preservation of natural vegetation communities in San Diego County. The MSCP addresses the potential impacts of urban growth, natural habitat loss, and species endangerment; and includes a plan to mitigate for the potential loss of the multiple covered species and their habitat due to the direct impacts of future development of both public and private lands within the MSCP area (City of San Diego, 1997).

Los Peñasquitos Lagoon Enhancement Plan and Program

The Los Peñasquitos Lagoon Foundation is dedicated to the restoration of the Lagoon, its associated uplands and the preservation of land for scenic, historic, educational, recreational, agricultural, scenic and open space opportunities. The Foundation regularly updates its Los Peñasquitos Lagoon Enhancement Plan and Program to reflect current Lagoon conditions and management needs and priorities. Current efforts the Foundation is undertaking include monitoring of the Lagoon and operation of a restoration basin.

Physical, Chemical, and Biological Monitoring

The Pacific Estuarine Research Laboratory (PERL), based at San Diego State University, was contracted by the Foundation to monitor lagoon resources and use the data in its studies of regional wetland ecosystems. PERL monitored the physical and chemical characteristics of Lagoon channel water from 1987-2007 and sampled benthic invertebrates, fish, and saltmarsh vegetation from 1988-2004. These studies have led to the timely opening of the mouth and an increase in knowledge of the biology of southern California's estuaries. In July 2004, Lagoon monitoring was transferred to the Southwest Wetlands Interpretive Association and the Tijuana River National Estuarine Research Reserve.

Los Peñasquitos Creek Restoration Basin
Located in the western reach of the Los Peñasquitos Canyon Preserve, the 2.8-acre restoration basin is designed to intercept sediment (4,400 cubic yard capacity) during moderate to large storm events, thereby helping protect the Lagoon from the impacts associated with sediment and siltation. In addition, the basin constructed by the Los Peñasquitos Lagoon Foundation was designed to minimize impacts to nearby sensitive habitats and the creek, view corridors for the public, and flooding risks to a nearby industrial park. All disturbed areas have been revegetated with native species of vegetation, replacing an area that was previously dominated by invasive plant species.

Los Peñasquitos Canyon Preserve Natural Resource Management Plan
The *Los Peñasquitos Canyon Preserve Natural Resource Management Plan (1998)* was developed to provide guidance for the present and future development and maintenance of the Los Peñasquitos Canyon Preserve. The City of San Diego Development Services and Park and Recreation Departments are responsible for the administration of this plan. The County Planning Department is responsible for the administration of land use permits for County-owned land in the Los Peñasquitos Canyon Preserve and review of all public and County development proposals to determine conformity with County policies, Natural Resource Management Plan, and CEQA. Funding for enhancement, management, and maintenance for the Los Peñasquitos Canyon Preserve can come from a variety of sources. Some of the objectives of this plan include:

- To establish management practices and means for implementation that will foster cooperative County-City management strategies to preserve and protect cultural and biological resources while providing for future recreational use, maintenance, and land use in the Los Peñasquitos Canyon Preserve
- To enhance and restore native habitats in the Los Peñasquitos Canyon Preserve
- To manage native wildlife species for their survival
- To identify and maintain important wildlife corridors
- To control erosion along trails and streambeds throughout the Los Peñasquitos Canyon Preserve and further protect the watersheds
- To facilitate public use which is compatible with the protection and preservation of the natural and historical resources, such as picnicking, hiking, and other low-intensity recreational activities
- To ensure individual projects within the Los Peñasquitos Canyon Preserve meet federal, state, and local environmental standards and requirements
- To conduct education, outreach, and research programs which increase public awareness of the unique natural and cultural resources within the Preserve
- The Los Peñasquitos Canyon Preserve will eventually house two interpretative facilities, one run by the County focusing on cultural and historical resources and second run by the City focusing on natural history and biological resources with a

proposed location somewhere in the eastern portion of the Los Peñasquitos Canyon Preserve. (CVCC, 2006)

Peñasquitos Watershed Urban Runoff Management Plan

The Peñasquitos Watershed Urban Runoff Management Plan 2008 (WURMP) was prepared by the City of Poway, as lead agency, in collaboration with the cities of San Diego, Del Mar, and the County of San Diego – all local agencies that have jurisdiction over the Peñasquitos Watershed. The WURMP meets the requirements of the National Pollutant Discharge Elimination System (NPDES) Municipal Storm Water Permit for San Diego Copermittees (San Diego Water Board Order No. 2007-01; "Order"). The Order requires development and implementation of WURMPs for each of nine watershed management areas within San Diego County, including the Peñasquitos watershed.

The primary goal of the Order is to positively affect the water resources of the Peñasquitos Watershed while balancing economic, social, and environmental constraints. The Order identifies four primary objectives to strive towards this goal: (1) develop and expand methods to assess and improve water quality within the watershed; (2) integrate watershed principles into land use planning; (3) enhance public understanding of sources of water pollution; and (4) encourage the development of stakeholder participation.

To help reach these goals and objectives, the WURMP identifies and prioritizes water quality related issues within the watershed that can be potentially attributed (wholly or partially) to discharges from the municipal storm drain systems and may be addressed through a cross-jurisdictional approach. Additionally, activities to abate sources of pollution and restore and protect beneficial uses are also identified.

The WURMP was designed as an iterative process of watershed assessment, priority setting, monitoring, and implementation. At the conclusion of each yearly cycle, the process begins anew, allowing participants to respond to changing conditions or adjust strategies that have not performed as anticipated. This framework establishes mechanisms for the participants to evaluate priorities, improve coordination, assess program goals, and allocate finite resources in a cost-effective manner.

Local General Plans and Municipal Codes

The County of San Diego and Cities of Del Mar, Poway, and San Diego each have their own General Plans and Municipal Codes that establish policies of acceptable land uses and practices in their jurisdictions. General Plans and Municipal Codes form the framework for the growth and land development for each community.

3.4 Regulatory Authorities

The following agencies have approval authority over the Basin Plan amendment, oversight on related regulatory and/or environmental matters, or responsibility for implementation of reasonably foreseeable means of compliance.

3.4.1 Federal Regulatory Agencies

U. S. Environmental Protection Agency

The US Environmental Protection Agency (US EPA) is responsible for implementing the Clean Water Act. Section 305(b) of the Clean Water Act mandates biennial assessments of the nation's water resources. These water quality assessments are used, with any other available data and information solicited from the public, to identify and prioritize waters not attaining water quality standards. The resulting amalgamation of waters is referred to as the "303(d) List" or the "Impaired Waters List." Clean Water Act section 303(d)(1)(C) and (d)(1)(D) require that the state establish TMDLs for each listed water. Those TMDLs, and the 303(d) List itself, must be submitted to USEPA every two years for approval under section 303(d)(2).

The Clean Water Act mandates TMDLs or other actions to resolve listings for all pollutant-water body pairs on the 303(d) List. In California, US EPA delegates responsibility for developing TMDLs to the Water Boards.

National Oceanic Atmospheric Administration/National Marine Fisheries Service (NOAA/NMFS)

With the US Fish and Wildlife Service, NOAA/NMFS conducts Endangered Species Act Section 7 consultation for effects to migratory and endangered fish species; NOAA/NMFS also enforces the Magnuson-Stevens Fishery Conservation and Management Act, under which it regulates projects that may have a significant effect on such species within the Los Peñasquitos watershed.

US Fish and Wildlife Service

The US Fish and Wildlife Service enforces the Endangered Species Act, the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act. With NOAA/NMFS, the agency conducts Endangered Species Act Section 7 consultation for possible effects to listed species with federal status.

US Army Corps of Engineers

The US Army Corps of Engineers issues Clean Water Act section 404 permits for discharges to waters of the United States and dredging and fill projects in navigable waters.

3.4.2 California State Regulatory Agencies

State Water Resources Control Board and the San Diego Regional Water Quality Control Board (Water Boards)

The primary responsibility for water quality protection in California rests with the State Water Resources Control Board (State Water Board) and the nine Regional Water Quality Control Boards (Regional Water Boards). The State Water Board and Regional Water Boards share responsibility for regulating storm water discharges. The State Water Board issues statewide NPDES permits for the California Department of Transportation (Caltrans); for construction that disturbs more than one acre (Construction General Permit Order 2009-0009-DWQ; and for small municipal separate storm sewer systems (MS4s) under a General Permit for the Discharge of Storm Water from Small MS4s (WQ Order No. 2003-0005-DWQ).

The Porter-Cologne Water Quality Protection Act of 1972 requires that water quality control plans in California, including basin plans and basin plan amendments, incorporate a plan of implementation.

The Water Quality Control Plan for the San Diego Basin, in which the TMDL for sediment in the Lagoon will be incorporated, is the master planning document for water quality in San Diego. Basin Plan provisions, including TMDL implementation plans, are carried out and enforced by the San Diego Water Board through its various permitting authorities, orders, and prohibitions.

The San Diego Water Board regulates storm water discharges from the NPDES Phase I MS4s that discharge to the Peñasquitos watershed. These permits require the municipalities to develop and implement comprehensive Storm Water Management Plans, which provide the framework for local government storm water programs.

NPDES municipal storm water permits generally have five-year update cycles. Following adoption of the TMDL, the San Diego Water Board will incorporate the TMDL's waste load allocations and associated milestone requirements into the permits, and require the co-permittees to amend their Storm Water Management Plans accordingly. While the California Department of Transportation is a Responsible Party to this TMDL and required to comply with the Water Quality Plan for the San Diego Basin when this TMDL is incorporated, the statewide NPDES permit regulating discharges from Caltrans will also be amended to include similar planning and waste load allocation requirements.

The San Diego Water Board regulates other storm water discharges in the watershed, including surface discharges from agricultural and grazing activities, through waste discharge requirements and waivers of waste discharge requirements for individual dischargers. Waste discharge requirements issued to a number of large commercial property owners require implementation of best management practices to address storm water discharges.

In addition, Army Corps of Engineers cannot issue its Clean Water Act Section 404 permits until the San Diego Water Board has certified those projects under Section 401.

California Department of Fish and Game
The California Department of Fish and Game issues permits for incidental takes of state listed species under sections 2081(b) and (c) of the California Endangered Species Act and provides section 2081 consultation for effects to listed species.

If the Department determines that an activity may substantially adversely affect fish and wildlife resources, the applicant must prepare a Stream Alteration Agreement that includes reasonable conditions necessary to protect those resources. Compliance with CEQA is also required.

California Coastal Commission
The Coastal Commission, in partnership with coastal cities and counties, plans and regulates the use of land and water in the coastal zone. Development activities, which are broadly defined by the California Coastal Act to include (among others) construction of buildings, divisions of land, and activities that change the intensity of use of land or public access to coastal waters, generally require a coastal development permit from either the Coastal Commission or the local government.

California State Lands Commission
The California State Lands Commission (CSLC) manages nearly 4 million acres of "sovereign lands," which includes the beds of (1) more than 120 rivers, streams, and sloughs; (2) nearly 40 non-tidal navigable lakes; (3) tidal navigable bays and lagoons; and (4) tidal and submerged lands adjacent to the entire coast and offshore islands of California from the mean high tide line to 3 nautical miles offshore. The CSLC manages this watery domain. The sovereign lands can only be used for public purposes consistent with provisions of the Public Trust such as fishing, water-dependent commerce and navigation, ecological preservation, and scientific study (CSLC, 2010).

3.4.3 Local Regulatory Agencies

The County of San Diego, City of San Diego, City of Del Mar, and City of Poway have plans, policies, and ordinances that may be used to require mitigation of impacts caused by the kinds of controls proposed in Basin Plan amendment. The municipalities' ordinances cover construction, grading, and development plans for land use regulations, community plans, and environmental statutes.

City of San Diego
The City of San Diego's General Plan establishes the citywide policies for growth and development. The City of San Diego's Community Plans provide refinement of the General Plan's citywide policies, designates land uses, and offers additional location-based recommendations. The Los Peñasquitos Watershed contains portions of the following communities within the City of San Diego: Torrey Pines, Torrey Hills, Carmel

Valley, Los Peñasquitos Canyon Preserve, Mira Mesa, Del Mar Mesa, Pacific Highlands Ranch, Torrey Highlands, Rancho Peñasquitos, Carmel Mountain Ranch, Sabre Springs, Miramar Ranch North, Scripps Miramar Ranch, and Rancho Encantada.

The City of San Diego implements and enforces the Elements of the General Plan (Land Use and Community Planning; Mobility; Economic Prosperity; Public Facilities, Services and Safety; Urban Design; Recreation; Historic Preservation; Conservation; Noise; and Housing) and Community Plans through its various departments including, but not limited to: Development Services, Environmental Services, Public Utilities, Park & Recreation, Public Works, and Transportation & Storm Water.

City of Poway
The City of Poway Public Works Department is responsible for the maintenance of public infrastructure and environmental programs including storm water and flood control. The City of Poway Department of Development Services administers and implements the City's planning, land use, building, and engineering functions. Other activities include providing customer service for all permit activities, developing land use ordinances and various specific plans, and reviewing development plans. These departments enforce the City of Poway's Municipal Code, which includes such ordinances as Stormwater Management and Discharge Control, Wildland-Urban Interface Code, Building Code, Excavating and Grading, Drainage and Watercourse, Floodplain Management, Standard Urban Stormwater Mitigation Plan, and Zoning.

City of Del Mar
The City of Del Mar Planning and Community Development Department is responsible for a variety of services ranging from updating the City's General Plan and Zoning standards, managing key programs and projects such as the Clean Water Program, to preparation of new standards. This department oversees building services, code enforcement, and new development and construction for compliance. The City of Del Mar enforces local ordinances including, but not limited to: Noise Regulations, Fire Code, Stormwater Management and Discharge Control, Building and Construction, and Zoning Ordinances through issuance of permits. Permits include, but are not limited to land conservation, excavation, and grading permits.

County of San Diego
Within the County of San Diego, the Land Use and Environmental Group coordinates the County's efforts in land use, environmental protection and preservation, recreation, and infrastructure development and maintenance. The Land Use and Environmental Group consists of seven departments: Air Pollution Control District; Agriculture, Weights and Measures; Environmental Health; Farm and Home Advisor; Parks and Recreation; Planning and Land Use; and Public Works. These departments issue a variety of permits to enforce County Ordinances including, but not limited to: Biological Mitigation; Resource Protection; Zoning; Watershed Protection, Stormwater Management, and Discharge Control; Noise; Flood Damage Protection; Habitat Loss Permit; Grading, Clearing, and Watercourses Ordinances.

Air Pollution Control District
The County of San Diego Air Pollution Control District evaluates and issues construction and operating permits to ensure proposed new or modified commercial and industrial equipment and operations comply with air pollution control laws.

Planning and Land Use
The County of San Diego Department of Planning and Land Use (DPLU) issues various permits including building and discretionary permits. The DPLU is home to the Green Building Program and Multiple Species Conservation Program. In general, DPLU helps create and maintain the general plan; maintain and improve the zoning ordinance; and advise the Board of Supervisors and San Diego County Planning Commission on land use projects.

Public Works
The County of San Diego Public Works Department issues a variety of permits including: construction, drainage easement encroachment, encroachment, excavation, grading, moving, planting, and traffic control permits. The Public Works Department is responsible for: County-maintained roads; traffic engineering; land development civil engineering review; design engineering and construction management; land surveying and map processing; cartographic services; watershed quality and flood protection; County Airports; solid waste planning and diversion; inactive landfills; wastewater systems management; and special districts, such as the Flood Control District.

3.5 Public Participation and Consultation

3.5.1 Consultation with other agencies

The Notice of Filing noticing the availability of the substitute environmental documents for this project was posted on the San Diego Water Board website and in the San Diego Union Tribune on February 15, 2012. The Notice of Filing indicated that the formal public comment period began on Wednesday, February 15, 2012 and ended on Monday, April 2, 2012, for a total of 47 days. The Notice of Filing indicated the public hearing date of May 9, 2012. The Notice of Filing serves as the notification to Responsible Agencies requesting consultation on the project and Trustee Agencies. As Trustee Agencies with resources affected by the project, the California Coastal Commission, California State Lands Commission, California Department of Fish and Game, US Fish and Wildlife Service, Office of Historic Preservation, and California Natural Resources Agency were provided the Notice of Filing by mail on Wednesday, February 15, 2012.

3.5.2 Public participation

CEQA's requirement for "Early Public Consultation" was met by holding a CEQA Scoping Meeting.[14] Notice of the CEQA Scoping Meeting for this project was issued on

[14] 14 CCR section 15083

January 6, 2011 for the February 15, 2011 CEQA Scoping Meeting. The notice was posted on the San Diego Water Board website on January 6, 2011, published in the North County Times on January 14, 2011, and published in the Union Tribune on January 13, 2011. The CEQA scoping meeting was held at the office of the San Diego Water Board on February 15, 2011 and was attended by city, county, and industry representatives. Comments received during the meeting have been incorporated into the substitute environmental documents.

A stakeholder advisory group (SAG) was formed at the onset of this project. Participants included representatives of the Cities of Del Mar, Poway, and San Diego, County of San Diego, Caltrans, US EPA, California State Parks, Los Peñasquitos Lagoon Foundation, Coast Law Group, Tetra Tech, and AMEC. During 2008-2011, the SAG met frequently to discuss project development. The SAG provided insightful technical comments on early drafts of reports, suggested issues for technical peer review, raised important policy issues, and assisted with drafting the Implementation Plan.

3.6 Implementation Plan: Reasonably Foreseeable Methods of Compliance with the Basin Plan amendment

The Basin Plan amendment implementation plan would require actions to achieve the TMDL targets and allocations for sediment, and other actions to enhance sediment-related habitat attributes essential to water quality in the Lagoon. The proposed Basin Plan amendment would affect all segments of the Lagoon and its tributaries.

The proposed Basin Plan amendment contains sediment allocations for dischargers. The amendment does not prescribe specific projects through which dischargers and discharge categories are to meet the sediment allocations.

The San Diego Water Board would not directly undertake any actions that could physically change the environment. Adoption of the proposed Basin Plan amendment, however, would result in future actions by landowners, municipalities and other agencies to comply with the requirements of the Basin Plan amendment and these actions could result in physical changes to the environment. The environmental impacts of such physical changes are evaluated below to the extent that they are reasonably foreseeable. Additionally, the Basin Plan amendment may result in future actions by municipalities to revise or adopt local permits, enforce local ordinances and permits, or educate watershed residents and businesses. In accordance with CEQA, changes that are speculative in nature do not require environmental review.

Until the parties that must comply with a permit or other requirements derived from the Basin Plan amendment propose specific projects, many physical changes cannot be anticipated. That said, it is reasonably foreseeable that the following environmental changes may result from reasonably foreseeable methods of compliance: (1) minor construction, (2) earthmoving, (3) vegetation enhancement, and (4) decrease storm flows in channels. Although these activities are reasonably foreseeable methods of compliance, the implementation plan does not specify the nature of these actions. Therefore, this analysis considers these actions in general programmatic terms. To

illustrate the possible nature of these activities, some examples are described following the table.

Table 3-1. Reasonable Foreseeable Compliance Projects

Possible Actions	Environmental Change Subject to Review
Install treatment facilities, for example, retention/infiltration basins, vegetated/bio-swales, buffer zones, and/or constructed wetlands)	Earthmoving, minor construction, and/or decrease storm flows in channels
Use of surface erosion source control BMPs (e.g., straw/fiber rolls, silt fencing, geotextile covers/mats, hydroseeding, and/or storm drain inlet protection)	Earthmoving, minor construction, and/or enhanced vegetation cover
Stabilize slopes (e.g., terracing, geotextile covers/mats, and/or hydroseeding)	Earthmoving, minor construction, and/or enhanced vegetation cover
Install bypass channels and/or dissipaters to slow storm water discharge velocity to canyons	Earthmoving and/or minor construction
Perform stream or Lagoon habitat restoration actions	Earthmoving, minor construction, and/or enhanced vegetation cover
Decrease storm water runoff from impervious surfaces through Low Impact Development	Earthmoving, minor construction, enhanced vegetation cover, and/or decrease storm flows in channels

- **Minor construction**. Basin Plan amendment-related construction projects would generally be small. Examples may include: a) construction of retention or infiltration basins to capture sediment and/or reduce surface runoff during storms; b) construction of vegetated swale/bioswales to deposit sediment entrained in surface runoff; c) retrofitting or replacement of road crossings over stream channels to increase capacity to convey peak runoff; d) construction of bypass channels and/or energy dissipaters immediately downstream of stormdrain outfalls to control or prevent channel erosion.
- **Earthmoving operations**. Adoption of the Basin Plan amendment would likely result in earthmoving to reduce sediment supply to the Lagoon and its tributaries. For example, earthmoving may involve constructing and maintaining retention/infiltration basins or terracing steep slopes and banks to reduce erosion rates. As a consequence of rapid channel incision, some channel reaches have become disconnected from the floodplain due to the narrow channels and high, steep, erosive stream banks. Earthmoving would occur to re-establish stable channel geometry in these channel reaches. Also, some actions can be undertaken to stabilize gullies or steep slopes, maintain BMPs, and/or to enhance stream channel habitat may involve earthmoving. Earthmoving may also be employed to re-contour portions of the Lagoon to support habitat diversity.

- **Decrease Flows in Channels.** Adoption of the Basin Plan amendment would foreseeably result in a decrease of wet weather flows in channels due to a reduction in peak discharge and a decrease in runoff volume from impermeable areas. A decrease in wet weather flows reduces erosion and the transport of sediment and pollutants. In addition, as the volume of dry weather flows decrease, nuisance flows are prevented from entering channels, resulting in a reduction of the channel's base flow. Resultant potential decreases in flow may contribute to a decrease in the amount of riparian vegetation on gravel bars, flood plains, and lower channel banks in some stream reaches as well as in the amount of riparian vegetation in the Lagoon.

These examples are not intended to be exhaustive or exclusive. Other conceivable actions that could be taken as a result of the Basin Plan amendment require speculation, and therefore, cannot be evaluated. For example, although the implementation plan recognizes coordinated planning efforts among local, state, and federal government agencies to enhance water quality within the Peñasquitos watershed, actual outcomes and specific actions resulting from the proposed partnership are too speculative to determine at this time. Also, as discussed above, even in cases where some physical changes are foreseeable, the exact nature of these changes is speculative pending specific project proposals that will be ultimately put forth by those subject to requirements derived from the Basin Plan amendment. Under CEQA, the permitting agencies will be the Lead Agencies for such future projects.

3.7 Environmental Checklist

This section contains the Lead Agency's analysis of reasonably foreseeable environmental effects of the proposed Basin Plan amendment in each category in the environmental checklist.[15] The proposed amendment does not define the specific actions that responsible parties would take to achieve water quality objectives. The San Diego Water Board has chosen not to specify methods of compliance with its regulations,[16] and accordingly, actual environmental impacts will necessarily depend upon compliance strategies selected by the responsible parties.

This analysis considers a reasonable range of compliance measures, as described in Section 3.6, above, and takes into account environmental and technical factors, population and geographic areas, and specific sites.

[15] Appendix A to 23CCR sections 3720-3781
[16] Water Code section 13360

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
I. AESTHETICS: Would the project:				
a) Have a substantial adverse effect on a scenic vista	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

Discussion:

a) Potential implementation projects resulting from this Basin Plan amendment that include minor construction for sediment reduction installations and habitat restoration activities would not substantially affect the scenic resource or vista, nor the existing visual character or quality of any scenic site and its surroundings. Any physical changes to the aesthetic environment as a result of the Basin Plan amendment would be small in scale and short-term in nature until vegetation re-establishes in any disturbed areas.

In addition, any potential implementation project will be required to comply with local ordinances, such as the County's Scenic Area Regulations[17] that regulate development in areas of high scenic value. Projects must also be consistent with general land use plans that exclude incompatible uses and structures to preserve and enhance the scenic resources in adjacent areas.[18]

Furthermore, one of the goals/objectives for urban habitat lands in the City of San Diego MSCP Subarea Plan is to afford visual enjoyment and psychological relief from urbanization, while supporting habitat for the maintenance of both common and rare species. Therefore, specific City of San Diego regulations that afford protection to MSCP areas also afford the protection of aesthetic and visual value. These regulations include the Resource Protection Ordinance; the Sensitive Coastal Resource Overlay Zone; the Environmentally Sensitive Lands Ordinance; and the Steep Hillside Guidelines.

For these reasons, the Water Board finds that implementation of the TMDL will cause a less than significant impact, if any, on any scenic vistas in the area.

[17] San Diego County Zoning Ordinance, Part 5 Special Area Regulations, section 5200
[18] San Diego County General Plan, Chapter 5 Conservation and Open Space Element, Visual Resources

b) Potential implementation projects would not result in adverse aesthetic impacts to state scenic highways because there are no officially designated State or County scenic highways within the Los Peñasquitos watershed (Caltrans, 2011).

c) Construction and installation of structural BMPs may create an aesthetically offensive view during construction and installation, but this would be temporary until construction is completed and re-vegetated areas become established. Potential implementation projects will be subject to permit review and compliance with local ordinances, such as the County's Scenic Area Regulations[19] that regulate development in areas of high scenic value and general land use plans that exclude incompatible uses and structures to preserve and enhance the scenic resources in adjacent. Structural BMPs can and should be designed to provide aesthetically pleasing wildlife habitat, recreational areas, and green spaces in addition to improving storm water quality. Appropriate architectural and landscape design practices, including screening, should be implemented to mitigate any adverse aesthetic effects or be constructed underground.

Furthermore, one of the goals/objectives for urban habitat lands in the City of San Diego MSCP Subarea Plan is to afford visual enjoyment and psychological relief from urbanization, while supporting habitat for the maintenance of both common and rare species. Therefore, City of San Diego regulations, which afford protection to MSCP areas, also afford protection of aesthetic and visual value in that area. These regulations include the Resource Protection Ordinance; the Sensitive Coastal Resource Overlay Zone; the Environmentally Sensitive Lands Ordinance; and the Steep Hillside Guidelines.

For these reasons, the Water Board finds that implementation of the TMDL will cause a less than significant impact on the existing visual character or quality of the site and its surroundings.

d) Actions and projects that implement the Basin Plan amendment would not foreseeably include new lighting or installation of large structures that could generate reflected sunlight or glare. Adoption of the Basin Plan amendment would not result in adverse light and glare impacts.

[19] Ibid.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
II. AGRICULTURE AND FOREST RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☒	☐
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☒	☐

Discussion:

a) According to the California Department of Conservation's (DOC) Farmland Mapping and Monitoring Program, the Los Peñasquitos watershed has a small amount of unique farmland acreage in the Cities of San Diego and Poway and the County of San Diego (DOC, 2010). DOC (2010) indicates that there is no prime farmland or farmland of statewide importance in the watershed. Potential BMP installations to reduce sediment discharge or storm flow and potential stream channel restoration activities will not cause a change in unique farmland land use. Therefore, adoption of the Basin Plan amendment will not result in conversion of prime farmland, unique farmland, or farmland of statewide importance to non-agricultural use and will not cause an impact.

b) According to the DOC's San Diego County Williamson Act Lands 2008 Map, there are no Williamson Act lands designated in the Los Peñasquitos watershed (DOC, 2009). Neither the City of San Diego nor the County has any exclusively zoned

agricultural zoning in the Los Peñasquitos watershed.[20] The City of Poway also does not have specific zoning for agriculture; however, agricultural lands are included in the Open Space-Resource Management zones.[21] BMP installations to reduce sediment discharges to protect downstream resources would not displace agricultural operations themselves. Additionally, potential implementation projects that include sediment reduction installations and habitat restoration activities would be relatively small in scale, be located in existing developed areas or on public lands along water courses, and would not conflict with existing agricultural zoning. Impacts on existing agricultural zones would be less than significant.

c) Potential implementation projects resulting from this Basin Plan amendment will not conflict with existing zoning for, or cause rezoning of, forest land, timberland, or timberland zoned Timberland Production because forest land or timberland do not exist in the Los Peñasquitos watershed (Shih, 2002).[22] Therefore, no impacts will occur.

d) Potential implementation projects will not result in the loss of forest land or conversion of forest land to non-forest use because forest land does not exist in the Los Peñasquitos watershed.[23] Therefore, no impacts will occur.

e) Adoption of the Basin Plan amendment could increase the level of landowner participation in cooperative efforts to minimize soil disturbance in sensitive areas (on steep slopes and adjacent to stream channels), which could result in localized, minor reductions in the amount of land cultivated, particularly adjacent to stream channels. However, because less than 1 percent of the Los Peñasquitos watershed is used for unique farmland (DOC, 2010), any buffer or setback areas, which would be fallow, would comprise a small amount of land area. Therefore, less than significant impacts would result.

[20] City of San Diego General Plan, Land Use and Community Planning Element, Figure LU-2; County of San Diego County General Plan Land Use Map.
[21] Poway General Plan, Community Development Element.
[22] City of San Diego General Plan, Land Use and Community Planning Element, Figure LU-2; Poway General Plan, Community Development Element; and County of San Diego County General Plan, Chapter 3 Land Use Element, Figure LU-1.
[23] City of San Diego General Plan, Land Use and Community Planning Element, Figure LU-2; County of San Diego County General Plan Land Use Map.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
III. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non- attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒

Discussion:

a) The California Air Resources Board (ARB) and local air districts are responsible for developing clean air plans to demonstrate how and when California will attain air quality standards established under both federal and California Clean Air Acts. The 1976 Lewis Air Quality Management Act established the San Diego Air Pollution Control District (APCD) and other air districts throughout the State. In San Diego, the US EPA has designated the San Diego Association of Governments (SANDAG) as the Metropolitan Planning Organization responsible for ensuring compliance with the requirements of the Clean Air Act for the San Diego Air Basin.

The San Diego Regional Air Quality Strategy (RAQS) outlines APCD's plans and control measures designed to bring the area into compliance with the requirements of federal and State air quality standards. The RAQS uses the assumptions and projections of local planning agencies to determine control strategies for regional compliance status (LSA Associates Inc., 2011). Since the RAQS is based on local General Plans, projects that are deemed consistent with the General Plan are found to be consistent with the air quality plan. Reasonably foreseeable methods of compliance would be assessed for consistency with local General Plans on a project specific basis. The proposed project in its entirety will not result in any population growth and thus lead to long-term regional air quality impacts.

Considering the above information, the project will not conflict with the RAQS, and no impact will result with respect to implementation of the air quality plan.

b) Both the state of California and the federal government have established health-based ambient air quality standards for seven air pollutants. These pollutants include ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), coarse particulate matter with a diameter of 10 microns or less (PM_{10}), fine particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), and lead. In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety.

Ambient air quality is in nonattainment with the federal 8-hour ozone standard, the state's 8-hour and 1-hour ozone standards, and the state's coarse and fine particulate matter standards (PM_{10} and $PM_{2.5}$, respectively; San Diego APCD, 2009).

In general, reasonably foreseeable air quality impacts from implementation of the Basin Plan amendment would be the result of construction activities and operation and maintenance.

Construction impacts predominantly result from two sources: fugitive dust from surface disturbance activities; and exhaust emissions resulting from the use of construction equipment (including, but not-limited to: graders, dozers, back hoes, haul trucks, stationary electricity generators, and construction worker vehicles). One of the pollutants of concern during construction is particulate matter, since PM_{10} is emitted as windblown (fugitive) dust during surface disturbance and as exhaust of diesel-fired construction equipment (particularly as $PM_{2.5}$). The potential for an incremental cancer risk resulting from diesel-fired construction equipment exists. Other emissions of concern include architectural coating products off-gassing (VOCs) and other sources of mobile source (on-road and off-road) combustion (NOx, SOx, CO, PM_{10}, $PM_{2.5}$, and VOCs) associated with the project (County of San Diego, 2007b).

Operational and maintenance emissions are those that would occur after project construction activities have been completed and the project becomes operational. These emissions are a result of increased average daily vehicle trips as well as any proposed stationary sources associated with the reasonably foreseeable method of compliance. Depending on the characteristics of the individual project, operational activities have the potential to generate emissions of criteria pollutants. Operational impacts are predominantly the result of vehicular traffic associated with projects. Combustion emissions (NOx, SOx, CO, PM_{10}, $PM_{2.5}$, and VOCs) associated with mobile sources are generally the primary concern. This includes diesel particulate emissions from that portion of the mobile fleet that runs on diesel fuel (County of San Diego, 2007b).

In September 2000, the ARB adopted the Diesel Risk Reduction Plan (Diesel RRP), which recommends many control measures to reduce the risks associated with DPM and to achieve goals of 75 percent diesel particulate matter reduction by 2010 and 85 percent by 2020. The Diesel RRP presents the ARB's proposal for a comprehensive plan to significantly reduce diesel PM emissions by requiring all new diesel-fueled vehicles and engines to use state-of-the-art catalyzed diesel particulate filters and very

low-sulfur diesel fuel. In addition, all existing vehicles and engines should be evaluated, and wherever technically feasible and cost-effective, retrofitted with diesel particulate filters (ARB, 2000).

Considering the above information, violation of any air quality standard or contribution to an existing or projected air quality violation will be less than significant.

c) See discussion to section (b), above.

Ambient air quality is in non-attainment with the federal 8-hour ozone standard, the state's 8-hour and 1-hour ozone standards, and the State's coarse and fine particulate matter standards (PM_{10} and $PM_{2.5}$, respectively) (San Diego APCD, 2009).

The project will result in a less than significant net increase of any criteria pollutant for which the San Diego Air Basin is non-attainment under an applicable federal or state ambient air quality standard.

d) Sensitive receptors may exist in areas where construction and operational emissions will occur and subject sensitive receptors to diesel-fired particulates and carbon monoxide. In San Diego County, APCD Rule 1210 implements the public notification and risk reduction requirements of state law, which requires facilities with high potential health risk levels to reduce health risks below significant risk levels. In addition, APCD Rule 1200 establishes acceptable risk levels and emission control requirements for new and modified facilities that may emit additional toxic air contaminants (TACs). Under Rule 1200, permits to operate may not be issued when emissions of TACs result in an incremental cancer risk greater than 1 in 1 million without application of Toxics-Best Available Control Technology (T-BACT), an incremental cancer risk greater than 10 in 1 million with application of T-BACT, or a health hazard index (chronic and acute) greater than one. The human health risk analysis is based on the time, duration, and exposures expected (County of San Diego, 2007b). Emissions from the potential implementation projects resulting from this Basin Plan amendment would be short in duration, infrequent, and occur on a small scale, and therefore would not have a high health risk potential.

Considering the above information, impacts to sensitive receptors will be less than significant.

e) The Basin Plan amendment would not involve the construction of any permanent sources of odor and therefore would not create objectionable odors affecting a substantial number of people. No odor impacts would result from the project.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
IV. BIOLOGICAL RESOURCES: Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☒	☐	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Discussion:

a) The MSCP Plan is a comprehensive, long-term habitat conservation plan that addresses the needs of multiple covered species and the preservation of natural vegetation communities in San Diego County. The MSCP addresses the potential impacts of urban growth, natural habitat loss, and species endangerment; and includes a plan to mitigate for the potential loss of the multiple covered species and their habitat due to the direct impacts of future development of both public and private lands within the MSCP area. The MSCP identifies special status species; see the Environmental Setting section of this analysis (City of San Diego, 1997).

The Basin Plan amendment was developed specifically to benefit, enhance, restore and protect biological resources, including fish, wildlife, rare and endangered species, and habitat. Nonetheless specific projects involving construction and earthmoving activities could potentially affect candidate, sensitive or special status species (collectively, special status species), either directly or through habitat modifications. Although minor construction and earthmoving operations would likely occur in already disturbed areas and might involve reconstruction, recontouring, or replacement of existing roads and structures, it is possible that these and other activities to reduce erosion and restore

stream or Lagoon habitat could occur in and impact areas where there are special status species and habitats.

Some proposed projects that could affect sensitive species would be subject to review and approval by the San Diego Water Board. The San Diego Water Board, in the course of carrying out its statutory duties to protect water quality and beneficial uses (including preservation of rare and endangered species and wildlife habitat as set forth in the Basin Plan), will either not approve compliance projects with significant adverse impacts on special status species and habitats or require avoidance or mitigation measures to reduce impacts to less than significant levels. It is not reasonably foreseeable that the San Diego Water Board would approve earthmoving work that would disrupt or destroy habitat of a known special status species (since protection of rare and endangered species is one of the beneficial uses we are protecting in the Lagoon). Furthermore, it is the San Diego Water Board's standard practice to work with the proponents of compliance projects to come up with actions that not only meet and further the proposed Basin Plan amendment's requirements and goals, but also all other components of the Basin Plan, such as protection of rare and endangered species and habitat. For example, where avoidance of impacts is not possible, the San Diego Water Board requires mitigation measures for work it approves that may impact special status species, riparian habitats, or other sensitive natural communities. These include but are not limited to requiring pre-construction surveys; construction buffers and setbacks; restrictions on construction during sensitive periods of time; employment of on-site biologists to oversee work; and avoidance of construction in known sensitive habitat areas or relocation and restoration of sensitive habitats.

In sum, through the course of the San Diego Water Board discharging its mandate to protect beneficial uses including rare and endangered species and wildlife habitat, impacts to special species and their habitats would be avoided or mitigated to less than significant levels.

If, however, impacts to the special status species and their habitats occur outside the San Diego Water Board's jurisdiction (e.g., in areas with no proximity or relation to waters of the state), then impacts must be addressed through other local, state, and federal regulatory programs. For example for projects that fill Clean Water Act Section 404 wetlands, the Army Corps of Engineers explicitly conditions its permits to require that impacts to federally listed species be less than significant. State and federal laws prohibit the take of special status species and their habitats except where incidental take permits have been issued. When issuing incidental take permits, state and federal agencies must ensure that the impacts of the take are minimized and mitigated to the maximum extent possible and ensure that the take will not appreciably reduce the likelihood of the survival and recovery of the species.

Proposed projects would be subject to the County of San Diego's Biological Mitigation Ordinance (BMO).[24] The BMO is the implementing ordinance for the Multiple Species Conservation Program County Subarea Plan. Compliance with this ordinance allows

[24] San Diego County Code, Title 8, Division 6, Chapter 5 Biological Mitigation Ordinance

the County to issue Incidental Take Permits for projects that impact sensitive habitats. The BMO establishes the criteria for avoiding impacts to Biological Resource Core Areas, to plant and animal populations within those areas, and the mitigation requirements for all projects requiring a discretionary permit. The BMO explains how mitigation for impacts is determined and establishes specific mitigation requirements for impacts to certain species. In addition, proposed projects would be subject to the County of San Diego's Resource Protection Ordinance (RPO).[25] The RPO requires that a Resource Protection Study must be completed prior to approval of any of the discretionary applications listed in section 86.603(a) of the San Diego County Code. If the Resource Protection Study identifies the presence of environmentally sensitive lands, one or more of the following actions may be required as a condition of approval for the discretionary permit: 1) Apply open space easements to portions of the project site that contain sensitive lands; 2) Rezone the entire project site through the application of a special area designator for sensitive lands; or 3) Other actions as determined by the decision-making body.[26]

Considering the above information, impacts, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service will be less than significant with mitigation.

b) As indicated in section a) above, the Basin Plan amendment is designed to benefit biological resources, particularly riparian habitat and other sensitive natural communities. Nonetheless activities to improve riparian conditions, such as channel restoration and Lagoon restoration, could result in minor and short term disruption to riparian habitat.

Projects proposed to comply with the Basin Plan amendment implementation plan involving grading or construction in the riparian corridor, are subject to review and approval by the San Diego Water Board. As described in section a) above, the San Diego Water Board, in the course of discharging its statutory duties to protect water quality and their beneficial uses will either not approve compliance projects with significant adverse impacts on riparian habitats and sensitive natural communities, or would require mitigation measures to reduce impacts to less than significant levels. Furthermore, it is the San Diego Water Board's standard practice to work with California Department of Fish and Game, US Fish and Wildlife Service, and proponents of compliance projects to come up with actions that not only meet and further the project objective, but also have minimal impacts. Mitigation measures routinely required by the San Diego Water Board include (but are not limited to) requiring pre-construction surveys; construction buffers and setbacks; restrictions on construction during sensitive periods of time; employment of on-site biologists to oversee work; and avoidance of construction in known sensitive habitat areas or relocation and restoration of sensitive habitats, but only if avoidance is impossible.

[25] San Diego County Code, Title 8, Division 6, Chapter 6 Resource Protection Ordinance
[26] San Diego County Code, Title 8, Division 6, Chapter 6, Section 86.603(c)

However, if impacts to sensitive natural communities occur outside the San Diego Water Board's jurisdiction, such as in upland communities, then impacts must be addressed through other local, state, and federal regulatory programs (as described in section a), above).

Considering the above information, impacts to any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or US Fish and Wildlife Service would be less than significant with mitigation.

c) Basin Plan amendment-related implementation actions may contribute to an increase in the acreage of land where habitat enhancement and/or erosion control projects are undertaken, a fraction of which could be within wetlands. The adverse impacts on wetlands would not be substantial. Under the Nationwide or Individual Permit programs administered by the US Army Corps of Engineers (per Section 404 of the Clean Water Act) there are general conditions that require that, for projects that may adversely affect wetlands, responsible parties must demonstrate that avoidance, minimization, and mitigation has occurred to the maximum extent practicable to ensure that adverse impacts to the aquatic environment are minimal. In addition, before the Army Corps can issue section a 404 permit, San Diego Water Board staff must certify the project (Section 401 certification) as compliant with state water quality standards, such as the Porter Cologne Water Quality Control Act, the California Wetland Conservation Policy, and the Basin Plan.

If a water or wetland, although delineated under the 404(b)(1) guidelines is not considered a Water of the United States (and therefore subject to Section 404 permitting by the Army Corps), as a water of California it is still protected by state laws. Proposed discharges to non-federal waters of the state are subject to Waste Discharge Requirements pursuant to Water Code section 13260.

This gives assurance that any potential impacts will be mitigated to a less than significant level.

d) The Basin Plan amendment would not substantially interfere with the movement of any native resident or migratory fish or wildlife species, with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. The main goal of the Basin Plan amendment is to improve and enhance the saltmarsh habitat in the Lagoon. Thus, compliance projects would entail improving habitat as wildlife corridors, not adversely affecting them. Therefore, no impacts will occur to the movement of any native resident or migratory fish or wildlife species, with established native resident or migratory wildlife corridors, or impacts to use of native wildlife nursery sites.

e) The Basin Plan amendment itself does not conflict with any local policies or ordinances protecting biological resources. Therefore, no impacts will occur.

f) The Basin Plan amendment itself does not conflict with any adopted Habitat Conservation Plan, Natural Community Plan, or other approved local, regional or state habitat conservation plan, including the Los Peñasquitos Lagoon Enhancement Plan and Los Peñasquitos Canyon Preserve Natural Resource Management Plan. Therefore, no impacts will occur.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
V. CULTURAL RESOURCES: Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☒	☐	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☒	☐	☐	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☒	☐	☐	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☒	☐

Discussion:

a) In 1824, Los Peñasquitos canyon became a Mexican land grant named *Rancho Santa Maria de los Peñasquitos. Rancho Peñasquitos* was continuously managed as a ranch under several owners until the entire Rancho was bought in 1962 for a proposed residential development. San Diego County's second oldest standing residence, Rancho de Los Peñasquitos, is a historic landmark.

Projects involving earthmoving or minor construction to comply with requirements of the proposed Basin Plan amendment are reasonably foreseeable. The activities could occur in areas of California State Park lands and in Los Peñasquitos Creek where historic artifacts are present. Development in the Los Peñasquitos watershed is subject to the San Diego County's Resource Protection Ordinance (RPO).[27] This ordinance requires that resources be evaluated with a Resource Protection Study and a finding that the use or development permitted by the application is consistent with the provisions of the RPO prior to approval of any of the following types of discretionary applications, which are not limited to: tentative maps, revised tentative maps, rezones, major use permit modifications, certificates of compliance, site plans, administrative permits, vacations of open space easements. The RPO prohibits development, trenching, grading, clearing, and grubbing, or any other activity or use that may result in damage to significant prehistoric or historic site lands, except for scientific investigations with an approved research design prepared by an archaeologist certified by the Society of Professional Archaeologists.[28]

[27] San Diego County Code, Title 8, Division 6, Chapter 6 Resource Protection Ordinance
[28] San Diego County Code, Resource Protection Ordinance, sections 86.601-86.608

Projects occurring within the City of San Diego are subject to the City of San Diego's Historical Resources Regulations,[29] which are intended to assure that development occurs in a manner that protects the overall quality of historical resources. It is further the intent of these regulations to protect the educational, cultural, economic, and general welfare of the public, while employing regulations that are consistent with sound historical preservation principles and the rights of private property owners.[30]

Furthermore, city and county General Plans contain policies that protect historic resources including the Conservation Element of the San Diego County General Plan, the Historical Preservation Element of the City of San Diego's General Plan, the Historical Structures Chapter of the City of Poway's Municipal Code, and the Historic Preservation Overlay Zone of the City of Del Mar's Municipal Code. In addition, California Public Resources Code section 5024.5 requires that all state agencies consult with the Office of Historic Preservation when any proposed project may adversely affect any historical resources on state-owned property (including state parks), and section 5024 requires that all state agencies inventory, register, preserve, and maintain all historical resources within their jurisdiction.

Considering the above information, the proposed projects that would occur as a result of the Basin Plan amendment would have a potentially significant impact on historical resources, but mitigation measures are available to reduce impacts to less than significant levels. However, implementation of these mitigation measures is within the jurisdiction of the local regulatory agencies listed in this document (Section 3.4.3). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations.[31]

b) The Los Peñasquitos watershed is known to contain archeological sites, with artifacts found showing indigenous people living there for over 6,000 years. In addition, considerable archeological interest has been centered on the Lagoon because of the proximity of many Indian middens and campsites. Because these sites were occupied by La Jolla Indians between four and five thousand years ago, they usually contain many shells of both lagoon and ocean mollusks, some animal bones, and primitive stone implements (Mudie et al., 1974).

Projects involving earthmoving or construction to comply with requirements of the proposed Basin Plan amendment are reasonably foreseeable. Construction would generally be small in scale, and earthmoving would likely occur in areas already disturbed by recent human activity (i.e., existing roads, and housing and industrial developments)—not at or in areas containing archaeological resources as defined by section 15064.5 of the CEQA Guidelines. In the event that unique archaeological resources are found, the project would be subject to California Public Resources Code section 21083.2, which requires that if a project will cause damage to a unique

[29] City of San Diego Municipal Code, Chapter 14, Article 3, Division 2 Historical Resources Regulations
[30] City of San Diego General Plan, Historic Preservation Element
[31] 14 CCR section 15091(a)(3)

archaeological resource, the lead agency for the project level environmental review may require reasonable efforts to be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. Examples of that treatment, in no order of preference, may include, but are not limited to, any of the following: 1) planning construction to avoid archaeological sites, 2) deeding archaeological sites into permanent conservation easements, 3) capping or covering archaeological sites with a layer of soil before building on the sites, and/or 4) planning parks, greenspace, or other open space to incorporate archaeological sites.

Furthermore, city and county General Plans contain policies that protect archaeological resources including the Conservation Element of the San Diego County General Plan, the Historical Preservation Element of the City of San Diego's General Plan, the Historical Structures Chapter of the City of Poway's Municipal Code, and the Historic Preservation Overlay Zone of the City of Del Mar's Municipal Code.

Considering the above information, the proposed projects that would occur as a result of the Basin Plan amendment would have a potentially significant impact on archaeological resources, but mitigation measures are available to reduce impacts to less than significant levels. However, implementation of these mitigation measures is within the jurisdiction of the local regulatory agencies listed in this document (Section 3.4.3). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations.[32]

c) Potential projects will involve earthmoving or construction to comply with requirements of the proposed Basin Plan amendment. These projects will occur near sea cliffs, on valley slopes, within the Lagoon, and/or in floodplains. Paleontological resources are typically found in the geologic deposits of sedimentary rock (e.g. sandstone, siltstone, mudstone, claystone, or shale) under surficial soil deposits within these types of areas. The Torrey Sandstone, Santiago Peak Volcanics Metasedimentary, and Lusardi Formation geologic units occur within the Peñasquitos watershed. The Torrey Sandstone and Lusardi Formation units have high resource sensitivities whereas the Santiago Peak Volcanics Metasedimentary unit has moderate resource sensitivity (City of San Diego, 2007). In general, formations with high resource potential are considered to have the highest potential to produce unique invertebrate fossil assemblages or unique vertebrate fossil remains and are, therefore, highly sensitive.

However, any project that is implemented will have to comply with local regulations and standards including the County of San Diego Grading Ordinance and the Conservation Element of the San Diego County General Plan. Section 87.430 of the Grading Ordinance provides for the requirement of a paleontological monitor at the discretion of the County. In addition, the suspension of grading operation is required upon the discovery of fossils greater than twelve inches in any dimension. The ordinance also

[32] 14 CCR section 15091(a)(3)

requires notification of the County Official (e.g. Permit Compliance Coordinator). The ordinance gives the County Official the authority to determine the appropriate resource recovery operations, which the permittee shall carry out prior to the County Official's authorization to resume normal grading operations. For projects occurring within the City of San Diego, resources are identified and protected through the environmental review process for discretionary projects. Through the City of San Diego's environmental process and prior to issuance of a Notice to Proceed (NTP) for any construction permits, including but not limited to, the first Grading Permit, Demolition Plans/Permits and Building Plans/Permits, the environmental review manager environmental designee shall verify that the requirements for Paleontological Monitoring have been noted on the appropriate construction documents.

Considering the above information, the proposed projects that would occur as a result of the Basin Plan amendment would have a potentially significant impact on paleontological resources, but mitigation measures are available to reduce impacts to less than significant levels. However, implementation of these mitigation measures is within the jurisdiction of the local regulatory agencies listed in this document (Section 3.4.3). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations.[33]

d) Projects involving earthmoving or construction to comply with requirements of the proposed Basin Plan amendment are reasonably foreseeable. Construction would generally be small in scale, and earthmoving would likely occur in areas already disturbed by recent human activity (i.e., existing roads, and housing and industrial developments)—not at or in areas human remains, such as the El Camino Memorial Park located in Sorrento Valley.

In the event that human remains are discovered during a project level activity, the project proponent would be subject to Health and Safety Code section 7050.5, which requires that there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlay adjacent remains until the County Coroner has examined the remains. If the Coroner determines the remains to be those of an American Indian, or has reason to believe that they are those of an American Indian, the Coroner contacts, by telephone within 24 hours, the Native American Heritage Commission.

Considering the above information, the proposed projects that would occur as a result of the Basin Plan amendment would not adversely affect human remains, and impacts would be less than significant.

[33] 14 CCR section 15091(a)(3)

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
VI. GEOLOGY AND SOILS: Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☐	☒
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☐	☒
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☒	☐	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

Discussion:

a) The project area is not located near Alquist-Priolo fault zone (Holocene faults) or a County Special Study fault zone (Late-Quaternary faults) (County of San Diego, 2007e, Figure 1 and 2); the Near-Source Zones for ground-shaking (County of San Diego, 2007e, Figure 3); or the Potential Liquefaction Areas (County of San Diego, 2010b, Figure 4.3.6). The project area does include landslide prone formations near the canyon and along the coast where steep slope and bluff exist (County of San Diego, 2010b, Figure 4.3.5). However, the Basin Plan amendment would not involve the construction of habitable structures; therefore, it would not result in any human safety risks of loss, injury, or death related to fault rupture, seismic ground-shaking, ground failure including liquefaction, or landslides. Therefore, no impacts will occur.

b) Specific projects involving earthmoving or construction activities to comply with requirements of the Basin Plan amendment are reasonably foreseeable. Such activities in general would not result in substantial soil erosion or the loss of topsoil since implementation of the Basin Plan amendment should reduce erosion rather than increase it. Temporary earthmoving operations could result in short-term, limited

erosion. Construction projects affecting an area of one acre or more would require a general construction National Pollutant Discharge Elimination System (NPDES) permit from the State Water Board, and implementation of a storm water pollution prevention plan to control sediment erosion and runoff. These projects will be subject to the review and inspection by the San Diego Water Board, and will require implementation of routine and standard erosion control best management practices and proper construction site management. Other grading projects would be subject to non-discretionary requirements of local ordinance and code to reduce potential soil erosion from grading. Therefore, the Basin Plan amendment would not result in substantial soil erosion, and any impacts would be less than significant with mitigation.

c) Even though the project area includes landslide prone formations near the canyon and along the coast where steep slope and bluff exist (County of San Diego, 2010b), implementation of the Basin Plan amendment will not cause or result in further instability of these areas. On the contrary, implementation of the Basin Plan amendment will require actions to reduce sediment sources that may include landslide areas, eroding gullies, river banks and roads. Potential implementation projects would be designed to increase the stabilities of these unstable areas, both onsite and off-site, including minimization of any potential for landslides. Therefore, the Basin Plan amendment would not involve activities that would create or trigger landslide, lateral spreading, subsidence, liquefaction or collapse, and its impacts would be less than significant.

d) The Basin Plan amendment would not involve construction of buildings (as defined in the Uniform Building Code) or any habitable structures. Minor grading and construction could occur in areas with expansive soils but this activity would not create a substantial risk to life or property. Therefore, the Basin Plan amendment would not result in impacts related to expansive soils.

e) The Basin Plan amendment would not require wastewater disposal systems; therefore, affected soils need not be capable of supporting the use of septic tanks or alternative wastewater disposal systems. No impacts would result from the project with respect to septic tanks or alternative wastewater disposal systems.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
VII. GREENHOUSE GAS EMISSIONS: Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☐	☒
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☒

Discussion:

a) Several reasonably foreseeable methods of compliance are likely to require additional motor vehicle trips and increased traffic during construction and maintenance of structural BMPs, which would increase greenhouse gas emissions from mobile sources. Considering the likely small contributions of the reasonably foreseeable methods of compliance relative to major facilities (i.e. cement plants, oil refineries, fossil-fueled electric-generating facilities/providers, cogeneration facilities, hydrogen plants, and other stationary combustion sources), the contribution from this implementation program is small in scale and the same as typical construction and maintenance activities in urbanized areas, such as road and infrastructure maintenance and building activities, and would not result in a significant impact on the environment.

b) In 2006, California passed AB 32, the Global Warming Solutions Act of 2006, which set the 2020 greenhouse gas emissions reduction goal into law. In December 2007, the California Air Resources Board (ARB) approved the 2020 emission limit of 427 million metric tons of CO_2 equivalents (CO_2e) of greenhouse gases. The 2020 target of 427 million metric tons of CO_2e requires the reduction of 169 million metric tons of CO_2e, or approximately 30 percent, from the state's projected 2020 emissions of 596 million metric tons of CO_2e (ARB, 2008).

AB 32 requires ARB to adopt mandatory reporting for the largest industrial sources to report and verify their greenhouse gas emissions. In 2007, ARB adopted the Regulation for the Mandatory Reporting of Greenhouse Gas Emissions. Currently, the regulation is being revised. A final rulemaking package was filed by ARB with the Office of Administrative Law on October 28, 2011. The regulation language applies to facilities on Table A-3 of 40 CFR Part 98, including cement plants, oil refineries, fossil-fueled electric-generating facilities/providers, cogeneration facilities, hydrogen plants, and other stationary combustion sources, regardless of emissions level. The regulation language also applies to facilities on Table A-4 of 40 CFR Part 98, including electronics manufacturing, fluorinated gas production, and glass production, that generate more than 10,000 metric tons/year CO_2e.[34] By requiring these largest facilities to report their emissions, approximately 94 percent of greenhouse gas emissions from industrial and commercial stationary sources in California will be accounted (ARB, 2007).

[34] 17 CCR sections 95100 – 95133 http://www.arb.ca.gov/regact/2010/ghg2010/mrrfro.pdf

On December 11, 2008, ARB adopted its Climate Change Scoping Plan with re-approval occurring on August, 24, 2011. The Scoping Plan proposes a comprehensive set of actions designed to reduce overall carbon emissions in California. Key elements of California's recommendations for reducing its greenhouse gas emissions to 1990 levels by 2020 include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewables energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related greenhouse gas emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the state's long term commitment to AB 32 implementation. (ARB, 2008)

lmplementation of this TMDL will not conflict with implementation of the Climate Change Scoping Plan and no impact will occur.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
VIII. HAZARDS AND HAZARDOUS MATERIALS: Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☒	☐
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☒	☐

Discussion:

a) Compliance with the Basin Plan amendment implementation plan does not involve the routine transport, use, or disposal of hazardous materials. Therefore, no impacts from the use, transport or disposal of hazardous materials would result.

b) The Basin Plan amendment does not include actions that are likely to result in upset or accident conditions involving the release of hazardous materials. Potential implementation projects that include sediment reduction installations and habitat restoration activities would be relatively small in scale, be located in existing developed areas or on public lands along water courses, and would not contain, handle, or store any potential sources of chemicals or compounds that would present a significant risk of accidental explosion or release of hazardous substances. Therefore, no impacts will occur.

c) Basin Plan amendment actions such as minor construction to reduce erosion and habitat restoration projects would be located along the storm water conveyance system right of way and stream channels in areas used as open space, which are not likely to contain schools. In any case, the Basin Plan amendment and TMDL implementation actions would not emit hazardous materials, substances, or waste. Therefore, no impact from hazardous materials would occur within one-quarter mile of an existing or proposed school.

d) It is unlikely that Basin Plan amendment actions would occur on sites that are included on lists of hazardous material sites compiled pursuant to Government Code Section 65962.5, such as leaky underground storage tank sites or sites where hazardous materials violations have occurred. The possibility that hazardous materials or substances will be encountered during project activities on or near these sites is speculative and need not be considered in this analysis. Therefore, there would be no impacts from hazardous materials sites.

e) The Basin Plan amendment does not include actions that would result in a safety hazard to people residing or working in any potential project areas from a public airport. The Los Peñasquitos watershed is not within an airport land use plan, or within two miles of a public airport or public use airport; therefore, the Basin Plan amendment would not result in an air safety hazard for people residing or working in the project area.

f) A large portion of the watershed lies within the overflight influence of the Marine Corps Air Station Miramar (MCAS Miramar), which is located in the Rose Canyon Creek watershed immediately to the south of Los Peñasquitos watershed (ALUC, 2010). MCAS Miramar Airport Land Use Compatibility Plan (MCAS Miramar ALUCP) indicates that a portion of the Lagoon and the lower part of Carroll Canyon are in Accident Potential Zone II (APZII) bordered by a narrow Transition Zone (TZ) around the perimeter (ALUC 2010). APZII and TZ are the third and final tiers of the safety-related zones identified by the US Marine Corps and have the lowest potential for occurrence of aircraft accidents of the safety zones, which is based on distance from the ends of the runways. MCAS Miramar ALUCP necessitates restrictions on land uses in these safety zones for infill development (construction of residential and nonresidential buildings where people will inhabit or congregate). Potential implementation projects that include minor construction for sediment reduction installations and habitat restoration activities are not identified as the type of development requiring restriction. However, the construction and maintenance activities associated with these types of projects would be expected to meet or be below the APZII Maximum Intensity Limit of 50 people per acre, as set by the MCAS Miramar ALUCP for the “Water, Rivers, Creeks, Canals, Wetlands, Bays, Lakes, and Reservoirs” land use. These types of implementation projects in these two safety zones have a low potential for ground hazard from flight-related accidents during the construction phase and periodic maintenance work and represent a less than significant impact.

There are several private heliports in the vicinity of the Lagoon and preserve and Carroll Canyon Creek: San Diego Heliport, Qualcomm Building T Heliport, Henley Heliport, the

Plaza La Jolla Village Heliport, and Scripps Memorial Hospital La Jolla Heliport. The Federal Aviation Administration published an Advisory Circular for Heliport Design (AC) that provides guidance with respect to the design of the touchdown and liftoff pad for helicopters and requirements for obstruction-free approach/departure paths (FAA, 2004). The AC recommends helipad protection zones for public use facilities. These zones, equivalent to runway protection zones at airports, extend 280 feet from the edge of the Final Approach and Takeoff Area (FATO). A FATO is generally larger than the physical pad itself and its size usually depends on the size of the helicopters that will utilize the helipad. Potential implementation projects that include minor construction for sediment reduction installations and habitat restoration activities are not likely to be within the protection zone of any of the local helipads. There would be no impact from the presence of these local helipads.

Considering the above information as a whole, potential implementation projects result in a less than significant impact to the safety for people residing or working in the project area.

g) The following applicable emergency response plans or emergency evacuation plans are evaluated for potential project consistency.

Unified San Diego County Emergency Services Organization Operational Area Emergency Plan

The Operational Area Emergency Plan is a comprehensive emergency plan that defines responsibilities, establishes an emergency organization, defines lines of communications, and is designed to be part of the Emergency Plan (County of San Diego, 2010d). It provides guidance for emergency planning and requires subsequent plans to be established by each jurisdiction that has responsibilities in a disaster situation. Potential implementation projects resulting from this Basin Plan amendment will not interfere with this plan because it will not prohibit subsequent plans from being established or prevent the goals and objectives of existing plans from being carried out.

Dam Evacuation Plans

Built in 1960, Lake Miramar Dam is made of earth and has a high relative hazard rating (County of San Diego, 2010b, Figure 4.3.2). The dam inundation area impacts the length of Carroll Canyon and the Lagoon. Potential implementation projects that include minor construction for sediment reduction installations and habitat restoration activities may be located in the dam inundation area, but will not interfere with the Dam Evacuation Plan because the project will not involve building of structures that would contain large concentrations of people or special needs individuals that would limit the ability of the County Office of Emergency Services to implement a dam evacuation plan.

Emergency Air Support

Emergency and fire air support services tend to fly lower to the ground than passenger airplanes for law enforcement activities, to carry out search and rescue missions, to collect water for firefighting, and to evacuate victims from remote areas (County of San Diego, 2007d). Emergency response aircraft require sufficient ground clearance to safely and efficiently function during an emergency response. Potential implementation

projects resulting from this Basin Plan amendment would not involve building structures that would create an obstruction that could compromise the safety of emergency response aircraft and their ability to effectively respond in an emergency could result in physical interference in the implementation of an emergency response.

In general, potential implementation projects that include minor construction for sediment reduction installations and habitat restoration activities resulting from the Basin Plan amendment would not interfere with any emergency response plans or emergency evacuation plans. Therefore, no impact would occur.

h) Potential implementation projects resulting from this Basin Plan amendment that include minor construction for sediment reduction installations and habitat restoration activities may be adjacent to wildlands that have the potential to support wildland fires. The natural areas within the Lagoon and the canyons that drain to the lagoon have wildfire hazard risk level designations of moderate, high, and very high (County of San Diego, 2010b, Figure 4.3.7). However, these potential projects will be required by the local permitting agencies to comply with regulations relating to emergency access, water supply, and defensible space specified in the 2010 California Fire Code (ICC 2010; as adopted, amended, or modified by the Cities of San Diego[35], Poway[36], and Del Mar[37]) and the 2011 Consolidated Fire Code for the County and 16 unincorporated Fire Protection Districts in San Diego County, as adopted and amended by the local fire protection district (County of San Diego, 2011b). Project proponents will have to prepare fire protection plans that describe the level of fire hazard and the methods proposed to minimize the hazard, as required by the applicable jurisdiction's regulations. Therefore, it is not likely that a potential project related to this Basin Plan amendment would increase fire hazards, nor would a potential project expose people or structures to a significant risk of loss, injury or death involving wildland fires. The impact would be less than significant.

[35] City of San Diego, San Diego Municipal Code, Chapter 5, Article 5: Fire Protection and Prevention. Adoption of portions of the California Fire Code (2007 Edition), except as otherwise provided in this article.
[36] City of Poway, Poway Municipal Code, Chapter 15.24, Fire Code. Adoption of 2010 California Fire Code including Appendix Chapters 1 and 4 and Appendices B and F, as published by the International Code Council, except those portions that are deleted, modified, or amended by this chapter.
[37] City of Del Mar, Del Mar Municipal Code, Chapter 10.04, Fire Code. Adoption of 2010 California Fire Code, including Appendix Chapters; Appendix Chapter 4, Appendix B and H, as published by the International Code Council.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
IX. HYDROLOGY AND WATER QUALITY: Would the project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☐	☒
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☒	☐	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☐	☒
e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?	☐	☒	☐	☐
f) Otherwise substantially degrade water quality?	☐	☐	☐	☒
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☒	☐
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☒	☐
j) Inundation by seiche, tsunami, or mudflow	☐	☐	☐	☒

Discussion:

a) The Basin Plan amendment articulates applicable water quality standards; therefore, once compliance with the WLAs and numeric targets are met in the watershed, there would be no violation of water quality standards or waste discharge requirements, and no adverse impacts to water quality would result.

b) This Basin Plan amendment may result in implementation projects that involve construction of facilities, such as retention basins, infiltration basins, or vegetated swales, which may increase storm water infiltration and subsequently return groundwater recharge rates to pre-development rates. Potential implementation

projects will not necessitate use of groundwater for any purpose, including irrigation, domestic or commercial demands. Potential implementation projects will not result in a decrease in groundwater supplies. No adverse impacts to groundwater recharge would result.

c) Potential implementation projects resulting from this Basin Plan amendment may involve earthmoving or minor construction activities during the installation of BMPs. These BMPS would reduce or eliminate soil erosion and sediment runoff and reduce wet-weather flows. The purpose of these types of projects would be to reduce overall soil erosion. Such projects would affect existing drainage patterns, but result in more stable hydrology. For example, installation of facilities such as retention/infiltration basins or bioswales would modify the drainage; however, the facility would ultimately reduce peak wet-weather flows to a lower-flow condition that would be less erosive than existing conditions. Installation of implementation projects would not result in substantial erosion or siltation on- or off-site and would be less than significant.

Potential habitat restoration projects in any of the creek channels or the Lagoon, including projects designed to improve tidal flushing, improve salt marsh habitat, and ultimately restore beneficial uses in the lagoon, could include activities such as removing accumulated sediments, stabilizing banks, restoring natural channels, and revegetating affected land areas. Such projects could also affect existing drainage patterns and result in substantial short-term impacts from erosion on- and off-site, until system stabilization occurred.

Restoration projects such as these, which involve fill or dredging in wetlands or riparian areas, require federal and state review pursuant to the Federal Clean Water Act (CWA), California Water Code, and California State Policies. The San Diego Water Board will require that project proponents implement standard erosion control best management practices and utilize proper construction site management through its CWA section 401 Water Quality Certification Program. In addition, construction projects greater than one acre in size would require a general construction NPDES permit and implementation of a storm water pollution prevention plan. Therefore, any identified substantial impacts from these potential implementation projects would be mitigated by Water Board-issued permit requirements and be less than significant with mitigation incorporated.

d) Potential implementation projects resulting from this Basin Plan amendment could involve earthmoving operations that could substantially affect existing drainage patterns. Some projects may be performed to terrace steep slopes to reduce erosion rates and landslide potential or to re-establish stable channel geometry in some channel reaches for the purpose of reconnecting stream channels with the floodplain. The purpose of these projects is to reduce sedimentation in streams, which has the effect of reducing flooding and is environmentally beneficial. The numeric target in this TMDL will encourage responsible parties to implement erosion control measures for compliance purposes.

Potential implementation projects will not substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site of project areas; therefore, there will be no adverse impact.

e) Activities related to potential implementation projects resulting from this Basin Plan amendment are, by design, intended to decrease peak runoff rates from upland land uses to reduce sediment input to the Lagoon. These potential implementation projects will likely result in a decrease of wet weather flows and associated pollutant loads to channels. Therefore, potential implementation projects resulting from this Basin Plan amendment would not result in creating or contributing additional runoff water that would exceed the capacity of the existing storm water drainage system.

Potential implementation projects that involve minor construction activities and earthmoving operations could result in additional sources of polluted runoff due to accidental release of sediment into the waterway and pollutants such as petroleum products from construction equipment during the construction-phase. Construction projects affecting an area of one acre or more would require a general construction National Pollutant Discharge Elimination System (NPDES) permit from the State Water Board and implementation of a storm water pollution prevention plan to control sediment erosion and runoff. The San Diego Water Board will require proper construction site management and implementation of standard best management practices to control erosion and prevent spills. Additionally, implementation projects will receive local planning and environmental review through mandatory permitting processes that evaluate projects, minimize environmental impacts, and assure project consistency with plans, policies, and ordinances, such as local grading ordinances.

The impact of potential implementation projects creating or contributing substantial additional sources of polluted runoff will be less than significant with mitigation.

f) Activities related to potential implementation projects resulting from this Basin Plan amendment are intended to reduce erosion and sediment inputs to the Lagoon. The purpose of the Basin Plan amendment is to correct the water quality impairment and restore beneficial uses. Therefore, the Basin Plan amendment would not substantially degrade water quality and no long-term adverse water quality impacts would occur as a result of potential implementation projects.

g) The Basin Plan amendment will not result in construction of housing. Therefore, no housing would be placed within the 100-year flood hazard zone as a result of the proposed action. No flood hazard impacts would occur.

h) The 100-year floodplain is located along the stream drainages in the canyons of the TMDL area (County of San Diego, 2010b, Figure 4.3.4). Potential implementation projects may be performed to terrace steep slopes to reduce erosion rates and landslide potential or to re-establish stable channel geometry in some channel reaches for the purpose of reconnecting stream channels with the floodplain. While these types of activities would be near or in the floodplain, it is not likely that it would interfere with the floodplain. Other projects are likely to involve habitat restoration activities that would

increase salt marsh habitat, improve tidal flushing, and improve the water body's capacity to absorb flood water.

The purpose of these projects is to reduce sedimentation in streams, which has the effect of reducing flooding and is environmentally beneficial. The Basin Plan amendment will therefore result in less than significant impacts to the impediment or redirection of flood flows within a 100-year flood hazard zone.

i) Built in 1960, Lake Miramar Dam is made of earth and has a high relative hazard rating (County of San Diego, 2010b, Figure 4.3.2). The dam inundation area impacts the length of Carroll Canyon and the Lagoon. Potential implementation projects that include minor construction for sediment reduction installations and habitat restoration activities may be located in the dam inundation area of the Lake Miramar Dam. People working on these projects could be exposed to significant risk of loss, injury or death involving flooding as a result of dam failure; but this risk is speculative as failure is unlikely to be caused by the small projects resulting from the Basin Plan amendment. Any such risk would be very small because of the short-term nature of the construction-phase of such projects. Furthermore, the Basin Plan amendment does not include construction of buildings or housing in the inundation area and will not expose people or structures to a significant risk from flooding. The project's impact would be less than significant.

j) Potential implementation projects resulting from this Basin Plan amendment are likely to be located in upland, in canyons, or within lagoon areas. None of these locations would be impacted by seiche inundation or tsunami. County of San Diego (2010b) has produced maps illustrating the hazards for coastal storms/erosion/tsunami and rain-induced landslide based on historic disaster information. The projected hazard of the maximum tsunami projected run-up affects 0.5 to 0.75 miles inland from the coastline at the estuary mouth (County of San Diego, 2010b, Figure 4.3.1). High risk hazard from coastal storm surge is not indicated for the coastline of the Lagoon mouth. The cliffs lining the canyon areas along Carmel, Los Peñasquitos, and lower Carroll Canyon Creeks are indicated as most susceptible for landslide (County of San Diego, 2010b, Figure 4.3.5); however, BMP construction or lagoon restoration activities would be unlikely to occur during wet weather. Potential implementation projects would not expose people or property of inundation due to seiche, tsunami, or mudflow and would create no impact.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
X. LAND USE AND PLANNING: Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b)Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

Discussion:

a) Potential implementation projects resulting from this Basin Plan amendment that include earthmoving and minor construction for sediment reduction installations and would not be of any size or configuration likely to physically divide an established community. Habitat restoration activities would likely occur within stream channels or the lagoon itself and would not introduce a new physical divide. Therefore, no adverse impact would occur.

b) Potential implementation projects that include earthmoving and minor construction for sediment reduction installations and habitat restoration activities would not conflict with any land use plan, policy, or regulation.

Installation of treatment control BMPs, such as infiltration/retention basins, buffer zones, or vegetated swales, would potentially reduce sediment; improve water quality, reduce peak storm water flows, increase infiltration of surface water, and/or decrease dry-weather flows. These types of BMPs are also used in Low Impact Development (LID) for the purpose of decreasing storm water runoff from impervious surfaces and reducing erosion hazards. LID is already required for land development and capital improvement projects within the cities and county jurisdictions (City of San Diego, 2011; City of Del Mar, 2011; County of San Diego, 2011a; Brown and Caldwell, 2011).[38]

Other potential BMPs that may be used are vegetation stabilization to prevent the occurrence of erosion, installation of energy dissipaters at the outlets of storm drains, culverts, conduits, or channels to slow storm water velocity in the canyons to prevent channel incision, and stabilization of steep or eroded slopes to reduce or eliminate erosion and landslide hazards. Stream channel restoration activities may be used to re-establish stable channel geometry to protect wetland function and minimize erosion. Additionally, the Basin Plan Amendment may require some restoration of lagoon habitat

[38] City of San Diego Municipal Code, Chapter 4, Article 3, Division 3, section 43.0307; Poway Municipal Code, Title 16, Division VI, Chapter 16.100; City of Del Mar Municipal Code, Title 11, Chapter 11.30; and County of San Diego Watershed Protection Ordinance, section 67.806.

to restore and enhance the biological value and hydrologic function of the coastal wetland.

These types of BMPs and activities may be used by the jurisdictions to maintain and improve infrastructure, conveyance system, and wetland resources and are consistent with the cities' and county general plan elements and ordinances.[39] Projects proposed to comply with Basin Plan amendment requirements would be subject to the review of these local agencies, assuring consistency with local land use plans or policies. For all of these reasons, no conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project is anticipated. Therefore, no impact would occur.

c) The Basin Plan amendment would not conflict with any habitat conservation plan or natural community conservation plan. Projects proposed to comply with Basin Plan amendment requirements would be subject to local agency review and would be conducted in accordance with the Multiple Species Conservation Plan (MSCP), the Los Peñasquitos Lagoon Enhancement Plan, and Los Peñasquitos Canyon Preserve Natural Resource Management Plan. The purposes of these plans are as follows:

- The MSCP addresses the potential impacts of urban growth, natural habitat loss, and species endangerment; and includes a plan to mitigate for the potential loss of the multiple covered species and their habitat due to the direct impacts of future development of both public and private lands within the MSCP area (City of San Diego, 1997).
- The Los Peñasquitos Lagoon Enhancement Plan and Program maintains an open lagoon mouth to support salt marsh habitat, maintains a native plant re-vegetation program to replace invasive species, and maintains a restoration basin to intercept sediment during moderate to large storm events.
- The City of San Diego Development Services and Park and Recreation Departments are responsible for the administration of the Los Peñasquitos Canyon Preserve Natural Resource Management Plan. Relevant objectives of this plan are to control erosion along trails and streambeds throughout the Los Peñasquitos Canyon Preserve, further protect the watersheds, and ensure individual projects within the Los Peñasquitos Canyon Preserve meet federal, state, and local environmental standards and requirements.

Potential projects resulting from this Basin Plan amendment will be consistent with existing habitat conservation plans, and no impact will occur.

[39] City of San Diego General Plan, Conservation and Public Facilities Elements; City of San Diego Municipal Code, Chapter 14, Article 2, Division 2, section 142.0220; City of San Diego Municipal Code, Chapter 14, Article 3, Division 1; City of Poway General Plan, Natural Resources Element; City of Del Mar Community Plan, Local Coastal Program Land Use Plan and Implementing Ordinances (Chapter 30.52); County of San Diego General Plan, Conservation and Open Space Element and Safety Element; and County of San Diego Grading Ordinance, Watershed Protection Ordinance, and Resource Protection Ordinance.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XI. MINERAL RESOURCES: Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

Discussion:

a) The watershed has large areas classified by the California Department of Conservation – Division of Mines and Geology as areas underlain by mineral deposits (MRZ-2) and areas of undetermined mineral resources (MRZ-3) (County of San Diego, 2008). There are two active aggregate facilities (i.e., sand, gravel, and crushed rock) located in Carroll Canyon, operated by Vulcan Materials Company and Hanson Aggregates, and an inactive rock quarry in Beeler Canyon located in Poway, currently operated as a concrete ready mix production facility by Vulcan Materials Company.

These facilities will be directly affected by the TMDL in that they may be subject to more stringent regulation to control the discharge of sediment by the San Diego Water Board through the Industrial Storm Water Permit or some other permitting or enforcement action. However, BMP installations to reduce sediment discharge or storm flow and stream/lagoon restoration activities will not prevent existing or future facilities from operating nor directly result in the loss of availability of known mineral resources of value to the region. Additionally, potential implementation projects that include sediment reduction installations and habitat restoration activities would be relatively small in scale, be located in existing developed areas or on public lands, and would not involve the construction of new buildings that would encroach upon existing or potential future mining sites.

Considering this information, the project will not impact the availability of mineral resources.

b) The City of San Diego's Conservation Element of the General Plan identifies a large area that includes Carroll Canyon, Mira Mesa, Scripps Ranch, and part of Rancho Peñasquitos as high quality mineral resource areas that are classified as MRZ-2. Many of these areas are already developed, and existing mining operations are in conflict with the MSCP. New facilities could be permitted provided the operation could be demonstrated to be compatible with the MSCP preserve goals for covered species and their habitats by protecting adjacent preserved areas and covered species, mitigating biological impacts, and restoring mined areas.

BMP installations would be used by facilities such as these to control and reduce sediment discharge from industrial operation areas to protect downstream resources

and would not displace or prevent the operations themselves. Additionally, potential implementation projects that include sediment reduction installations and habitat restoration activities would be relatively small in scale, be located in existing developed areas or on public lands along water courses, and would not involve the construction of new buildings that would encroach upon existing or potential future mining sites. Potentially significant loss of availability of a known mineral resource or locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan will not occur as a result of this project.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XII. NOISE: Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☒	☐

Discussion:

a) Potential implementation projects resulting from this Basin Plan amendment that include earthmoving and construction could temporarily generate noise during the construction phase of those projects. In general, potential sediment reduction installations and habitat restoration activities would occur in discrete, localized areas throughout the watershed and would be located in outdoor and open space areas. Construction noise levels would be temporary in nature and similar to typical construction site projects. Potential projects will not generate construction noise that exceeds local noise ordinances for discretionary projects.[40] For this reason, a less than significant impact would occur.

[40] City of San Diego Municipal Code, Chapter 5, Article 9.5; Poway Municipal Code Chapter 8.08; City of Del Mar Municipal Code, Title 9, Chapter 9.20; County of San Diego Noise Ordinance, Title 3, Division 6, Chapter 4, sections 36.404 and 36.409.

b) To comply with requirements derived from the Basin Plan amendment, potential implementation projects involving earthmoving or minor construction could occur near noise sensitive land uses, such as a hospital, school, hotel, or library. These projects would be in discrete, localized areas throughout the watershed and would be located in outdoor and open space areas. Construction noise levels would be temporary in nature and similar to typical construction site projects. The possibility that potential projects would include blasting or boring activity is speculative and need not be considered in this analysis. Therefore, there would be no impacts from groundborne vibration and noise.

c) The Basin Plan amendment would not cause any permanent increase in ambient noise levels.

d) To comply with requirements derived from the Basin Plan amendment, potential implementation projects involving earthmoving or construction could result in a temporary increase in ambient noise levels. In general, potential sediment reduction installations and habitat restoration activities would be located in outdoor and open space areas, would not be a facility that contains noise-generating equipment, and would have construction noise levels similar to typical construction site projects. Potential projects will not generate construction noise levels that exceed local noise ordinances for discretionary projects.[41] Therefore, impacts from temporary increases in ambient noise would be less than significant.

e) The Los Peñasquitos watershed is not within an airport land use plan, or within two miles of a public airport or public use airport; therefore, the Basin Plan amendment would not result in exposure of people residing or working in any potential project areas to excessive noise levels.

f) The Los Peñasquitos watershed does not contain any private airstrips. However, a large portion of the watershed lies within the overflight influence of the MCAS Miramar. MCAS Miramar ALUCP indicates that Carroll Canyon, Sorrento Valley, parts of Mira Mesa, and a portion of the Los Peñasquitos Reserve are within the noise exposure contours for 60 – 65 dB CNEL[42] future average exposure and 65 – 70 dB CNEL annual day exposure (ALUC, 2010, Map MIR-1: Noise Compatibility Policy Map). Additionally, there are several private heliports in the vicinity of the Lagoon and preserve, and Carroll Canyon Creek: San Diego Heliport, Qualcomm Building T Heliport, Henley Heliport, the Plaza La Jolla Village Heliport, and Scripps Memorial Hospital La Jolla Heliport.

[41] City of San Diego Municipal Code, Chapter 5, Article 9.5; Poway Municipal Code Chapter 8.08; City of Del Mar Municipal Code, Title 9, Chapter 9.20; County of San Diego Noise Ordinance, Title 3, Division 6, Chapter 4, sections 36.404 and 36.409.

[42] Community Noise Equivalent Level (CNEL) is the noise metric adopted by the State of California for land use planning purposes, including describing airport noise impacts. This noise metric compensates for the increase in people's sensitivity to noise during nighttime hours. The noise impacts typically are depicted by a set of contours, each of which represents points having the same CNEL value (ALUC, 2010).

Potential implementation projects in these areas resulting from this Basin Plan amendment would not cause any permanent exposure of residents to additional sources of noise above airport or heliport noise. Any persons constructing or maintaining BMPs within this area would be exposed to short-term noise levels from air traffic. Therefore, the impacts from private airstrip-generated noise to people working in potential project areas would be less than significant.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XIII. POPULATION AND HOUSING: Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Discussion:

a) The Basin Plan amendment would not induce substantial population growth in the Los Peñasquitos watershed. Potential implementation projects resulting from this Basin Plan amendment will not propose a physical or regulatory change that would construct new public facilities that foster population or economic growth, construct new housing or businesses, or extend roads or infrastructure. Therefore, no impacts would occur.

b) Potential implementation projects resulting from the Basin Plan amendment would be contained within the storm water conveyance system right of way. Therefore, such projects would not be located to displace existing housing or any people that would need replacement housing. Therefore, no impact would occur.

c) The Basin Plan amendment would not displace substantial numbers of people or create a need for the construction of replacement housing (see discussion to section (b), above), and no impacts would occur.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XIV. PUBLIC SERVICES:				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	☐	☐	☐	☒
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

Discussion:

a) Compliance with the Basin Plan amendment would not involve provision or alteration of government facilities. Therefore the Basin Plan amendment would not affect service ratios, response times, or other performance objectives for fire protection, schools, or other public facilities and no impact would occur.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XV. RECREATION:				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

Discussion:

a) Potential implementation projects resulting from this Basin Plan amendment that occur within the Los Peñasquitos Canyon Preserve could affect public access of trails during construction activities. However, projects would be small in scale, short in duration, and would not substantially affect park usage. In any case, such short-term shifts in use patterns would not result in substantial physical deterioration of park or recreation facilities and no impact would occur.

b) Although the Basin Plan amendment could result in some changes in road and trail configurations or permitted uses that could alter recreational use patterns, these changes would not result in the need for construction of or expansion of recreational facilities that could have an adverse effect on the environment. No impact is anticipated.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XVI. TRANSPORTATION/TRAFFIC: Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☐	☒
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☐	☒
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☒	☐

Discussion:

a) Adoption of the Basin Plan amendment will not interfere with public transit routes or pedestrian/bicycle trails and paths. Potential implementation projects would not create substantial traffic in relation to the existing load and capacity of existing street systems, and therefore, will not be in conflict with local general plans, the Regional Transportation Plan and Congestion Management Program,[43] the County Transportation Impact Fee Ordinance,[44] the Pedestrian Master Plan (City of San Diego, 2006), and other policies.

b) Potential implementation projects resulting from this Basin Plan amendment would require mobilization of construction vehicles to perform minor construction and habitat restoration activities. Any increase in traffic would be temporary and would be limited to local areas in the vicinity of individual construction or restoration projects. It is anticipated that individual projects would mobilize equipment at the beginning and end of the work and not generate a significant increase in traffic congestion. Additionally, potential implementation projects would not increase population or provide employment;

[43] SANDAG 2050 Regional Transportation Plan, Appendices, and Technical Appendices: http://www.sandag.org/index.asp?projectid=349&fuseaction=projects.detail (SANDAG, 2011)
[44] San Diego County, Ordinance to Amend the San Diego County Code Related to The Transportation Impact Fee. Effective April 27, 2008.

therefore, they would not generate any permanent increase in traffic congestion and would not affect level of service standards established by the SANDAG Congestion Management Program,[45] Poway Comprehensive Master Plan (Transportation Element),[46] or County Public Road Standards.[47] Therefore, the Basin Plan amendment would not result in permanent, substantial increases in traffic above existing conditions and not be in conflict with applicable congestion management programs and road standards. No impacts would occur.

c) Potential implementation projects would not result in a change in air traffic patterns or air traffic levels. The Basin Plan amendment would not affect air traffic that would result in substantial safety risks. No impacts would occur.

d) This Basin Plan amendment does not include provisions to construct new roads or modify existing roads to add sharp curves or dangerous intersections. No new hazards due to the design or engineering of the road network in the Los Peñasquitos watershed will occur and no incompatible uses will be introduced; therefore, there will be no impact from this project.

e) Potential implementation projects resulting from this Basin Plan amendment may be located in canyon and natural areas that may have limited access points. These areas are public lands that are managed by local municipalities, including the local fire and emergency response services agency. For this reason, it is not expected that emergency access would be an issue. Adoption of the Basin Plan amendment would not result in inadequate emergency access. No impacts would occur.

f) To the extent that potential implementation projects that include minor construction for sediment reduction installations and habitat restoration activities are conducted in locations near pedestrian or bike paths in the canyon and lagoon areas, there exists the potential to temporarily hinder access points or affect trails depending on the proximity to construction equipment. However, projects are not expected to permanently affect or reduce existing or future pedestrian, bicycle, or equestrian facilities. If pedestrian, bicycle, or equestrian safety issues are present, then conditions are placed on the project prior to approval to address those concerns. Also, potential implementation projects will not generate additional, ongoing motor vehicle trips that would increase traffic or congestion nor create design features on road segments/intersections that would create a hazard to pedestrians, bicyclists, or mass transit. In general, adoption of this Basin Plan amendment will not conflict with local plans and policies, including the City of San Diego's Mobility and Recreation Elements (General Plan) and the Pedestrian Master Plan (City of San Diego, 2006) supporting alternative transportation. Any impacts would be less than significant.

[45] SANDAG, Final 2008 Congestion Management Program Update.
[46] Poway Comprehensive Plan: General Plan, Transportation Element.
[47] San Diego County Ordinance No. 10040 (N.S.), An Ordinance Amending Section 81.102 (bb) of the San Diego County Code to Provide a Reference to Amended Public Road Standards, February 24, 2010. http://www.sdcounty.ca.gov/dpw/docs/pbrdstds.pdf

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XVII. UTILITIES AND SERVICE SYSTEMS: Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☒	☐	☐
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

Discussion:

a) Potential implementation projects resulting from this Basin Plan amendment will not involve any uses that discharge any wastewater to sanitary sewer or on-site wastewater treatment systems. Therefore, there will not be any exceedance of any wastewater treatment requirements and no impacts will occur.

b) The Basin Plan amendment does not require, nor will potential implementation projects resulting from this Basin Plan amendment involve, the construction or expansion of water or wastewater treatment facilities. No impacts would be caused by this project.

c) Basin Plan amendment-related projects will likely include construction of new or expanded storm water drainage facilities that will treat accelerated storm water flows by slowing them and reducing both sediment and associated pollutants in storm water runoff and dry weather flows. Construction of these facilities affecting an area of one acre or more would require a general construction NPDES permit from the State Water Board, and implementation of a storm water pollution prevention plan to control sediment erosion and runoff. These projects will be subject to the review and inspection by the San Diego Water Board, and will require implementation of routine and standard erosion control best management practices and proper construction site management. Overall, any new facilities will improve water quality, reduce erosion, improve hydrology,

and/or restore wetland function. The environmental impact from the construction of implementation projects such as these would be less than significant with mitigation incorporated.

d) The Basin Plan amendment does not require, nor will potential implementation projects resulting from this Basin Plan amendment involve, water supply or services from a water district. Construction and maintenance of structural and non-structural BMPs would not rely on water service. Therefore, no impacts would occur.

e) The Basin Plan amendment and any potential implementation projects resulting from the amendment would not increase population or provide employment, and therefore, would not require an ongoing water supply or additional wastewater treatment services. No impacts would occur from this project.

f) Basin Plan amendment implementation may affect municipal solid waste generation or landfill capacities related to ongoing maintenance of BMPs. Such maintenance is likely to result in removal of debris and sediments from culverts, sedimentation basins, etc. The net volume of waste will be relatively small and infrequent; therefore, impacts will be less than significant.

g) The waste generated from BMP maintenance will be subject to federal, state, and local statutes and regulations related to solid waste. Such waste would not be expected to contain pollutants or materials that would violate statutes and regulations related to solid waste. Thus, no impacts would occur.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XVIII. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☒ ~~☐~~	☐	☐	☐ ~~☒~~
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☒	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

Discussion:

a) As discussed in the checklist, reasonably foreseeable methods of compliance would not substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels~~, or eliminate important examples of the major periods of California history or prehistory~~. The proposed Basin Plan amendment is intended to increase the extent of areas with high biological importance. It is expected that reduced sediment loading from stormwater discharges consistent with the watershed sediment reduction target will encourage the establishment of native vegetation in degraded areas through various mechanisms. BMP implementation actions designed to reduce sedimentation will also likely reduce nuisance freshwater flows into the Lagoon that have historically contributed to observed habitat and beneficial use impacts. Reasonably foreseeable methods of compliance will facilitate recovery of beneficial uses that have been affected by various complex processes, including sedimentation, nuisance flows, reduced tidal circulation, and other factors. An adaptive management approach will be used to determine the most effective course of action to achieve the numeric targets and improve beneficial uses in the Lagoon with the least environmental impact. ~~Considering the above information, no impacts will occur.~~ The reasonably foreseeable methods of compliance may cause some impacts to historical resources, but the impact by individual projects cannot be determined at the program level; a project level CEQA analysis will be performed by a local lead agency. However, regardless of the level of CEQA analysis, it is unlikely that the reasonable foreseeable methods of compliance are unavoidable as to cause elimination of important examples of the major periods of California history or prehistory. First of all, according to CEQA section 15064.5, a historical resource must be eligible as determined by the State Historical Resources Commission, and must be listed in the California Register of Historical Resources.

Secondly, should a specific project identify significant impacts to historical resources, according to CEQA section 15091, no public agency shall approve or carry out the project unless changes or alterations are made to avoid or alleviate the significant effects. The changes or alterations include those that are within the responsibility and jurisdiction of other public agency and not the agency making the finding; that have been adopted by such other agency or can and should be adopted by such other agency. In fact, the following regulations have been adopted by other agencies: the Conservation Element of the San Diego County General Plan, the Historical Preservation Element of the City of San Diego's General Plan, the Historical Structures Chapter of the City of Poway's Municipal Code, and the Historic Preservation Overlay Zone of the City of Del Mar's Municipal Code. The project not only will be reviewed and cleared before being approved by appropriate public agencies, but also will be closely monitored during the whole process, and will require mitigation measures to avoid and reduce such impact. However, despite the above information, as specific mitigation measures cannot be identified as specific projects are not identified, the impacts remain potentially significant.

Therefore, c~~C~~onsidering the above information, potentially significant impacts may ~~no impacts will~~ occur.

b) This SED concludes that reasonably foreseeable methods of compliance may result in potentially significant impacts to historical, archaeological, and paleontological resources (see explanation above for Cultural Resources). In examining the potential for cumulatively considerable effects, impacts to these historical, archaeological, and paleontological resources together with the effects of other known projects in or near the Los Peñasquitos watershed were considered that also involve minor construction and earthmoving. The contribution of the proposed Basin Plan amendment could be relatively major due to the wide-distribution of reasonably foreseeable methods of compliance throughout the watershed. However, as discussed in the checklist, these impacts could be fully offset if adequately mitigated on the project level by the lead agency. Therefore, the proposed Basin Plan amendment will have a less than significant cumulative effect on historical, archaeological, and paleontological resources. No other resources have the potential to be directly or indirectly impacted by the project.

c) The Basin Plan amendment would not cause any substantial adverse effects to human beings, either directly or indirectly. The Basin Plan amendment is intended to benefit human beings through implementation of actions to improve water quality and enhance habitat in the Lagoon. No impacts would occur.

3.8 Economic Factors

This section presents the San Diego Water Board's economic analysis of the most reasonably foreseeable methods of compliance with the Basin Plan amendment to incorporate the sediment TMDL for the Lagoon.

3.8.1 Legal Requirement for Economic Analysis

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

The purposes of this cost analysis are to provide the San Diego Water Board with information concerning the potential cost of implementing this TMDL and to address concerns about costs that may be raised by responsible parties. Potential costs are analyzed for the most reasonably foreseeable methods of compliance with this Basin Plan amendment, as discussed in Section 3.6.

Furthermore, the San Diego Water Board must comply with CEQA when amending the Basin Plan.[48] The CEQA process requires the San Diego Water Board to analyze and disclose the potential adverse environmental impacts of a Basin Plan amendment that is being considered for approval. The San Diego Water Board must consider the economic costs of the methods of compliance in this analysis.[49]

3.8.2 TMDL Project Implementation Costs

The cost of implementing this TMDL will range widely, depending on methods that the responsible parties select to meet the Waste Load and Load Allocations. The specific controls to be implemented for sediment reduction will be chosen by the responsible parties after adoption of this Basin Plan amendment. All costs are preliminary estimates only since particular elements of a control, such as type, size, and location, would need to be developed to provide a basis for more accurate cost estimations. Identifying the specific controls that responsible parties will choose to implement is speculative at this time, and the controls presented in this section serve only to demonstrate potential costs. Additional controls for storm water runoff from agriculture, livestock, and horse ranch facilities other than what is already required in existing WDRs for these facilities and in the Basin Plan WDR Waiver Policy is not reasonably foreseeable. Therefore, there will be no additional costs to agricultural and livestock facility owners and operators to comply with these TMDLs.

3.8.3 Cost Estimates of Typical Controls for Urban Runoff Discharges

Approximate costs associated with typical structural BMPs that might be implemented as reasonably foreseeable methods of compliance are provided below. Cost estimates for structural BMPs cited from "*Stormwater Best Management Practice Handbook – New Development and Redevelopment. 2003*" are for new construction costs only (CASQA, 2003). These estimates generally do not take into account retrofit of existing structures or the potential purchase on land needed for the BMP. Cost estimates provided by Caltrans' *BMP Pilot Retrofit Pilot Program* were from BMPs retrofitted on existing state owned land (Caltrans, 2004).

[48] Public Resources Code section 21080
[49] See Public Resources Code section 21159(c)

Treatment Facilities

Vegetated Swales:

Vegetated swales are constructed along drainage ways where storm water runoff is conveyed. Vegetation in swales and strips allows for the filtering of pollutants and infiltration of runoff into groundwater. Densely vegetated swales can be designed to add visual interest to a site or to screen unsightly views. They reduce runoff velocities, which allows sediment and other pollutants to settle out.

The effectiveness of vegetated swales depends on slopes of swales, soil permeability, grass cover density, contact time of storm water runoff and intensity of storm events. Vegetated swales, based on case studies, are capable of managing runoff from small drainage areas with approximate sizes of 10 acres.

Construction of swales begins with site clearing, grubbing, excavation, leveling and tilling, thereafter followed with seeding and vegetation planting. The cost of developing a swale unit is estimated in the range of $7,300 to $20,800 (CASQA, 2003). Routine maintenance activities include keeping up the hydraulic and removal efficiency of the channel, periodic mowing, weed control, watering, reseeding and clearing of debris and blockages for a dense, healthy grass cover.

Little data is available to estimate the difference in cost between various swale designs; however, with considerations of inflation rate to bring the monetary value to current and the vast areas, the unit price of constructing a vegetated swale is assumed to be $8,800 dollars each. Acreage of the Los Peñasquitos watershed requires approximately 2,738 units of vegetated swales to treat the 42.78 square miles of impervious surfaces in the watershed, which results in the overall cost of $24.1 million. Amortized with interest rate of 6 percent annually and into 20 years based on the implementation schedule, and with the average annual maintenance rate of 5 percent, the total annual cost is $2.17 million.

Maintenance costs derive primarily from mowing because all operation and maintenance is related to vegetation management requiring no special training. In addition, it is important to note that the special attention to the presence of gophers is a factor that can make operations and maintenance cumbersome.

Table 3-2. Summary of estimated cost for vegetative swales

Items	**Unit Cost**	**Total Cost**
Construction	$8,800 per unit swale for each 10-acre drainage area	$24.1 million $2.07 million annually if amortized with an interest rate of 6% for 20 years.
Maintenance	5 percent of construction cost annually	$104,000 annually
Total Cost		$2.17 million annually

Extended Detention Basins

Extended detention basins are basins whose outlets have been designed to detain the storm water runoff to allow particles to settle. These facilities differ from wet ponds in the sense that they do not offer a large permanent pool. Extended detention basins also provide flood control due to additional flood detention storage.

The construction costs associated with extended detention basins vary considerably. Using the equation $C=12.4V^{0.760}$, where C is the cost and V is the volume, adjusted to 2011 dollars, a one acre-foot pond costs $50,855, and a 100 acre-foot pond costs $1,687,000 (CASQA, 2003). Designing for the 85th percentile storm (ranges from 0.55 to 0.85 inches; average 0.7 inches; County of San Diego, 2011a), the Los Peñasquitos watershed requires approximately 1,598 one acre-foot ponds or 16 100 acre-foot ponds to treat the 42.78 square miles of impervious surfaces in the watershed, which results in overall cost ranges from $27 million to $81.3 million. The total annual cost ranges from $2.55 million to $7.69 million, amortized with interest rate of 6 percent annually for 20 years (based on the implementation schedule) and using a maximum maintenance rate of 10 percent.

Maintenance costs are between 3 and 10 percent, not including any cost to dispose of the accumulated sediment (CASQA, 2003). Necessary operation and maintenance activities include, but are not limited to, mowing side slopes, managing pesticides and nutrients, mosquito control, repairing undercut or eroded areas, as well as removing litter and debris on an as needed basis. Larger maintenance projects include the removal of accumulated sediment and regrading roughly about every 10-25 years or when sediment volume exceeds 10-20 percent of the basins volume or accumulates to 6 inches. The removal of sediment from the forebay every 3-5 years can slow the overall accumulation of sediments within the basin.

Table 3-3. Summary of estimated cost for extended detention basins

Items	**1 Acre-Foot Basin Cost**	**100 Acre-Foot Basin Cost**
Construction	$50,855 per basin treating for 1 acre-foot of stormwater	$1,687,000 per basin treating for 100 acre-foot of stormwater
Construction Cost	$81.3 million for 1,598 basins $6.99 million if amortized with an interest rate of 6% for 20 years.	$27.0 million for 16 basins $2.32 million annually if amortized with an interest rate of 6% for 20 years.
Maintenance	10 percent of construction cost annually	10 percent of construction cost annually
Maintenance Cost	$699,000 annually	$232,000 annually
Total Cost	$7.69 million annually	$2.55 million annually

Surface Erosion Controls

Straw Fiber Rolls

Straw fiber rolls are tube shaped erosion control devices that are most effective in low shear stress areas. Straw fiber rolls are especially useful in preventing surface erosion as they complement best management practices aimed at source control and vegetation.

Material costs for fiber rolls range from $20 to $30 per 25-foot roll (CASQA, 2003). Labor costs vary, however they should be factored in for the installation, maintenance, and short-term maintenance. The maintenance requirements of fiber rolls are minimal, but short-term inspection is recommended to ensure that the rolls remain firmly anchored in place and are not crushed or damaged by equipment traffic. There is no labor cost associated with removing these devices as they are biodegradable.

Slope Stabilization

Terracing

Terracing is a technique using earthen embankments and/or ridge and channel systems that reduce erosion by slowing, collecting, and redistributing surface runoff to stable outlets. This technique is especially applicable to the San Diego region because terracing is most effective in arid climates with expected water erosion problems.

Costs associated with terrace construction ranges between $1 and $6 per linear foot in addition to varying costs related to the construction of waterways and underground outlets (Natural Resources Conservation Service). Operations and maintenance cost derive from labor costs associated with sediment removal and periodic terrace repair.

Geotextile Covers/Mats

Geotextiles are porous fabrics that protect ground surfaces susceptible to storm water and wind erosion. These devices also increase stability by allowing for more vegetation growth as they hold in place fertilizers, seeds, and top soil. The effectiveness of geotextile covers is dependent upon their material.

The costs of using is geotextiles range between $1 and $17 per square yard, depending on the type used (State Water Board, 1991). Operations and maintenance cost derive from labor associated with regular inspection to determine the existence of cracks, tears, or breaches in the fabric.

Bypass Channels and/or Dissipaters

Storm Drain Repair and Replacement

Repairing and replacing existing storm drain systems will allow the existing controls to properly function, thus minimizing and/or eliminating erosion below storm drain outfalls. Such projects may include replacement of existing pipes and work on existing drainage easements. Repair and replacement projects can be done gradually at a minimal impact to residents in the area. The 7017 Keighley Court Storm Drain Repair Project in the City of San Diego is estimated to cost $277,714 (City of San Diego, 2012a). Similarly the Wenrich Drive Storm Drain Repair Project costs roughly $213,150 (City of San Diego, 2012b).

Stream or Lagoon Habitat Restoration Actions

Lagoon Restoration

Throughout the southern California region rapid development has yielded unprecedented levels of sedimentation compromising the overall health of surrounding streams and lagoons. The restoration of lagoons is important in the San Diego region

for protection of the few remaining coastal wetlands to benefit fish, birds, and various wildlife species. In addition to the scenic beauty lagoons provide, continued maintenance protects public health from stagnant water and the accumulation of mosquitos and dead fish.

The overall cost of enhancing the larger, neighboring Batiquitos Lagoon was approximately $57.3 million in 1996 dollars, which adjusted for inflation would cost $82.1 million. This cost included planning, permitting, design, and management/administrative costs, as well as funding of the long-term maintenance program. The major project components included: construction of two low-profile rock jetties at the ocean entrance of the lagoon to maintain a permanent non-navigable tidal opening to the ocean without cutting off the southerly littoral drift, physical reconfiguration of the lagoon through dredging and contouring to create shallow subtidal and intertidal habitats, nourishment of adjacent ocean beaches with clean sands mined from the lagoon as part of the overall dredging and disposal plan, construction of approximately 32 acres of least tern nesting sites, and pilot planting of vegetation that requires tidal flushing and that did not occur in the lagoon including cordgrass (*Spartina foliosa*) and eelgrass (*Zoastera marina*) (Appy, 2012).

The San Dieguito Lagoon restoration project was completed in 2011 at a cost of $90 million (SDRVC, 2012). The project was proposed by Southern California Edison to fulfill permit conditions for the creation or substantial restoration of at least 150 acres of Southern California coastal wetlands as compensatory mitigation for fish losses caused by the San Onofre Nuclear Generating Station. Project elements included: cut and fill, water control structures, stormwater control measures, buffers and transition areas, removal of exotic species, and protection of existing salt marsh plants. The project provided the following habitat benefits: increased acreage of tidal habitats with beneficial impacts on associated species; improved functions and values of existing tidal habitats with beneficial impacts on associated species; enhanced functions and values of seasonal wetlands with beneficial impacts on associated species; restoration of native upland habitats with beneficial impacts on associated species; and creation of nesting sites benefiting California least tern, Western snowy plover, and other waterbirds contributing to the restoration of ecosystem functions and values (Southern California Edison, 2005).

While restoration activities in the Lagoon are not expected to occur at the scale experienced in the neighboring Batiquitos and San Dieguito Lagoons, these case studies provide a reasonable estimation of the maximum cost associated with lagoon restoration. Lagoon restoration in the Lagoon is estimated to cost $90 million. Amortized with interest rate of 6 percent annually and into 20 years based on the implementation schedule, the total annual cost is $7.74 million.

Low Impact Development

Low Impact Development (LID)

LID emphasizes conservation and use of on-site natural features to protect water quality. LID can significantly increase the protection of water quality through the implementation of engineered small-scale hydrologic controls that replicate the pre-

development hydrologic regime of watersheds through infiltrating, filtering, storing, evaporating, and detaining runoff close to its source. Hazards associated with storm water runoff, such as increased sedimentation and the pollution of water bodies can greatly be decreased through the implementation of LID techniques in both new and redesigned developments. Provided below are a number of various methods to aid in the reduction of hazardous storm water runoff into San Diego's regional water bodies.

Cisterns and rain barrels are LID techniques used to harvest, store, and release rain water from a roof downspout into the soil. This technique is useful in areas covered primarily with impervious surfaces. Rain barrels are used for smaller residential environments and cisterns for large scale commercial and industrial developments. The cost of a rain barrel is approximately $216 for a single residential lot. The cost of a cistern can range from $160 for a 165 gallon polyethylene tank to $10,000 for a 5,000 gallon fiberglass/steel composite tank (LIDC, 2007).

Vegetated roofs are an effective LID technique that provides storm water runoff control, air quality improvement, increased energy efficiency, urban heat island reduction, and improved aesthetics. A vegetated roof system uses foliage and a light weight soil mixture to absorb, filter, and detain rainfall. Installation of a vegetated roof cost between $10-16 per square foot (US EPA, 2000).

Permeable pavement design consists of a porous surface with an underlying stone reservoir to temporarily hold surface water runoff before it enters the subsoil. This increases groundwater infiltration and decreases storm water runoff into surrounding waterbodies. The strength of this LID techniques lies within its ability to balance both increased runoff infiltration and uses such as walking and/or driving. Porous concrete can range from $2 to $6 per square foot and various pavers can range from $1 to $10 per square foot, with grass and gravel pavers making up the lower range and concrete and stone pavers making up the higher range (PATH, 2008). Because of differences in surface texture and the importance for flow path through the surface, maintenance of permeable pavements is critical to their effectiveness. Cleaning by vacuum sweeping and pressure washing is generally recommended several times a year, depending on usage and traffic. With more traffic, the maintenance must increase (PATH, 2008).

Cost Comparison

Table 3-4 summarizes the estimated total costs as results of implementing this TMDL. The overall project costs arising from lagoon restoration activities and pollutant loading reduction in storm water could be in a range of $116.2 million to $185.2 million. With consideration of the maintenance cost to structural BMPs such as vegetated swales and extended detention basins, this overall cost may amortized, at an interest rate of 6 percent, to become as low as $9.91 million per year during implementation of this TMDL.

Table 3-4. Cost Summary for storm water treatment implementation alternatives

Implementation Alternatives	Lagoon restoration and vegetative swales	Lagoon restoration and 1 acre-foot basins	Lagoon restoration and 100 acre-foot basins

Total Project Cost	$116.2 million	$185.2 million	$121.6 million
Amortized Annual Cost	$9.91 million	$15.43 million	$10.29 million

3.9 Reasonable Alternatives to the Proposed Activity

The environmental analysis must include an analysis of reasonable alternatives to the proposed activity.[50] The proposed activity is a Basin Plan amendment to incorporate a sediment TMDL for Los Peñasquitos Lagoon. The purpose of this analysis is to determine if there is an alternative that would feasibly attain the basic objective of the rule or regulation (the proposed activity), but would lessen, avoid, or eliminate any identified impacts. The alternatives are discussed in the subsections below.

3.9.1 Alternative 1 – San Diego Water Board TMDL

This program alternative is based on the TMDL that is presently proposed for San Diego Water Board consideration. The proposed TMDL focuses on the reduction of sediment loads to the natural background loading rate in the Los Peñasquitos Watershed. The WLAs and LAs, as well as compliance schedules, are established through the Basin Plan amendment. The WLAs and the implementation schedule, once incorporated into the Basin Plan, will be considered by NPDES permit writers when developing permit limits that are adopted in separate actions by the San Diego and State Water Boards.

Foreseeable environmental impacts from methods of compliance, as discussed in Section 3.6, are well known and explored throughout the contents of this document. Potential adverse impacts to the environment stem principally from the installation, operation, and maintenance of structural BMPs. This document analyzes these impacts and concludes that installation of implementation projects are relatively short duration and small scale construction and maintenance activities that will result in less than significant environmental impacts. It also concludes that the benefits of the program outweigh any less than significant adverse environmental effects.

3.9.2 Alternative 2 – US EPA TMDL

This program alternative is based on a TMDL that would be established by the US Environmental Protection Agency (US EPA) if the San Diego Water Board fails to adopt a sediment TMDL for the Lagoon, pursuant to the Clean Water Act section 303(d). Because the technical analysis by US EPA will be very similar to the San Diego Water Board analysis, and because the same laws and regulations would apply, it is assumed that the technical portions, WLAs, and LAs of this TMDL program alternative will be essentially the same as program Alternative 1. However, such a TMDL is not implemented through a Basin Plan amendment. Therefore, the WLAs will be implemented through NPDES permit limits without consideration of a compliance schedule. Because NPDES permits are renewed every five years, all responsible parties would be required to be in full compliance immediately following the TMDL adoption by US EPA, or within five years.

[50] 23 CCR section 3777

Absent US EPA completion of an alternative TMDL, it would be speculative to evaluate whether or not reasonable foreseeable actions needed to achieve the alternative TMDL would reduce or increase environmental impacts (as compared to Alternative 1). Nevertheless, it is anticipated that this alternative would achieve compliance through the same foreseeable compliance projects listed in Table 3-1 analyzed for Alternative 1.

3.9.1 No Action Alternative

This program alternative assumes that neither the US EPA nor the San Diego Water Board implements a sediment TMDL for the Lagoon. While responsible parties could implement BMPs on a discretionary basis, this CEQA analysis is based on the assumption that no additional sediment reduction BMPs would be implemented in addition to those that are presently in place. However, Alternative 3 is contrary to federal and state law. While impacts to the environment from construction or maintenance of structural BMPs would be avoided in this alternative, failure to implement a TMDL would not restore beneficial uses in the Lagoon due to sediment impairment. In comparison, either Alternative 1 or 2 will restore beneficial uses and attain water quality standards by reducing sediment loads, thus representing a benefit to the environment, while Alternative 3 will result in a continued sediment impairment of the Lagoon.

3.9.2 Preferred Alternative

This environmental analysis finds that Alternative 1 is the most environmentally advantageous alternative.

Alternative 3 is not feasible because there is a legal requirement under the Clean Water Act to address the section 303(d) impairment listing. This alternative is not assumed to implement BMP projects to reduce sediment loads and restore beneficial uses in the Lagoon in a timely fashion, if at all. While Alternative 3 will avoid potential impacts due to discrete installation project, the waterbody impairment will continue.

Both Program Alternatives 1 and 2 will comply with the law and reduce sediment loads and restore beneficial uses in the Lagoon at a comparatively small environmental cost through completion of the foreseeable compliance projects listed in Table 3-1 of section 3.6. The key difference between these two program alternatives is the establishment of an implementation schedule. While the same LAs and WLAs will need to be met and the same technological choices will be available by both alternatives, Alternative 1 will allow a measured implementation plan, resulting in full compliance in 20 years. Alternative 2, in contrast, will require compliance at the time of TMDL adoption or permit renewal, which in all NPDES permit cases, is at most 5 years. The environmental impacts due to Alternative 2 may be of greater severity as the intensity of implementation actions will be greater to comply with the shorter time frame. The longer schedule of Alternative 1 allows for prioritization and planning, more thoroughly mitigated impacts, more appropriately designed, sited and sized structural devices and, therefore, less environmental impact in general. In addition, prioritization and planning will likely result in more efficient use of funds and lower overall costs.

3.10 Other Environmental Considerations

This section evaluates several other environmental considerations of reasonably foreseeable methods of complying with the Sediment TMDL, specifically:

3.10.1 Cumulative Impacts of the Program Alternatives (as required by CEQA Guidelines section 15130);

3.10.2 Potential Growth-Inducing Effects of the Program Alternatives (as required by CEQA Guidelines section 15126); and

3.10.3 Unavoidable Significant Impacts (as required by CEQA Guidelines section 15126.2).

3.10.1 Cumulative Impacts

Cumulative impacts, defined in Section 15355 of the CEQA Guidelines, refer to two or more individual effects, that when considered together, are considerable or that increase other environmental impacts. Cumulative impact assessment must consider not only the impacts of the proposed TMDL, but also the impacts from other municipal and private past, present, and future projects, which would occur in the watershed.

As discussed in the checklist, this SED concludes that reasonably foreseeable methods of compliance may result in potentially significant impacts to historical, archaeological, and paleontological resources (see explanation above for Cultural Resources). In examining the potential for cumulatively considerable effects, impacts to these historical, archaeological, and paleontological resources together with the effects of other known projects in or near the Los Peñasquitos watershed were considered that also involve minor construction and earthmoving. The following past, present, and future projects were considered:

- I-805 HOV Extension/Carroll Canyon Road Extension
- Carmel Valley Neighborhood 10
- Peñasquitos Glens Unit Number 4 of the Almazon Residences Project
- Los Peñasquitos Lagoon Basin
- Sorrento-Miramar Curve Realignment and Second Main Track Project
- Sorrento Pointe Development
- Sprint Nextel Black Mountain Middle School
- Bridge Replacement Project

None of the above listed projects identified significant impacts on historical, archaeological, or paleontological resources; however, several projects mitigated impacts to less than significant levels. The contribution of the proposed Basin Plan

amendment could be relatively major due to the wide-distribution of reasonably foreseeable methods of compliance throughout the watershed. However, as discussed in the checklist, these impacts could be fully offset if adequately mitigated on the project level by the lead agency.

3.10.2 Growth-Inducing Impacts

This section presents the following:

1) An overview of the CEQA Guidelines relevant to evaluating growth inducement,

2) A discussion of the types of growth that can occur in the Los Peñasquitos watershed,

3) A discussion of obstacles to growth in the watershed, and

4) An evaluation of the potential for the TMDL Program Alternatives to induce growth.

CEQA Growth-Inducing Guidelines

Growth-inducing impacts are defined by the State CEQA Guidelines as (CEQA Guidelines, Section 15126.2(d)):

> The ways in which a proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are impacts which would remove obstacles to population growth. Increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects... [In addition,] the characteristics of some projects… may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It is not assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.

Growth inducement indirectly could result in adverse environmental effects if the induced growth is not consistent with or accommodated by the land use plans and growth management plans and policies. Local land use plans provide for land use development patterns and growth policies that encourage orderly urban development supported by adequate public services, such as water supply, roadway infrastructure, sewer services, and solid waste disposal services.

Public works projects that are developed to address future unplanned needs (i.e., that would not accommodate planned growth) could result in removing obstacles to population growth. Direct growth inducement would result if, for example, a project involved the construction of new wastewater treatment facilities to accommodate populations in excess of those projected by local or regional planning agencies. Indirect

growth inducement would result if a project accommodated unplanned growth and indirectly established substantial new permanent employment opportunities (for example, new commercial, industrial, or governmental enterprises) or if a project involved a construction effort with substantial short-term employment opportunities that indirectly would stimulate the need for additional housing and services. Growth inducement also could occur if the project would affect the timing or location of either population or land use growth, or create a surplus in infrastructure capacity.

Types of Growth

The primary types of growth that occur within the Sediment TMDL area are:

1) Development of land, and

2) Population growth (Economic growth, such as the creation of additional job opportunities, also could occur; however, such growth generally would lead to population growth and, therefore, is included indirectly in population growth.)

Growth in Land Development
Growth in land development is the physical development of residential, commercial, and industrial structures in the Sediment TMDL area. Land use growth is subject to general plans, community plans, parcel zoning, and applicable entitlements and is dependent on adequate infrastructure to support development.

Population Growth
Population growth is growth in the number of persons that live and work in the Sediment TMDL area and other jurisdictions within the boundaries of the area. Population growth occurs from natural causes (births minus deaths) and net emigration to or immigration from other geographical areas. Emigration or immigration can occur in response to economic opportunities, life style choices, or for personal reasons.

Although land use growth and population growth are interrelated, land use and population growth could occur independently from each other. This has occurred in the past where the housing growth is minimal, but population within the area continues to increase. Such a situation results in increasing population densities with a corresponding demand for services, despite minimal land use growth.

Overall development in the County of San Diego and Cities of San Diego, Del Mar, and Poway is governed by their General Plans, which are intended to direct land use development in an orderly manner. The General Plan is the framework under which development occurs, and, within this framework, other land use entitlements (such as variances and conditional use permits) can be obtained. Because the General Plan guides land use development and allows for entitlements, it does not represent an obstacle to land use growth. The cities within the Sediment TMDL area also have plans which direct land use development.

Existing Obstacles to Growth

Obstacles to growth could include such things as inadequate infrastructure, such as an inadequate water supply that results in rationing, or inadequate wastewater treatment capacity that results in restrictions in land use development. Policies that discourage either natural population growth or immigration also are considered to be obstacles to growth.

Potential for Compliance with the Proposed TMDL to Induce Growth

Direct Growth Inducement
Because the reasonably foreseeable methods of compliance with the proposed Sediment TMDL focus on structural BMPs, non-structural BMPs and improvements to the storm drain system which are located throughout the urbanized portion of this TMDL area, this TMDL would not result in the construction of new housing and, therefore, would not directly induce growth.

Indirect Growth Inducement
Two areas of potential indirect growth inducement are relevant to a discussion of the proposed TMDL: (1) the potential for compliance with the TMDL to generate economic opportunities that could lead to additional immigration, and (2) the potential for the proposed TMDL to remove an obstacle to land use or population growth.

Installation and/or construction of structural BMPs to comply with the proposed TMDL would occur over a 20-year time period. Installation and maintenance spending for compliance would generate jobs throughout the region and elsewhere where goods and services are purchased or used to install structural BMPs. Based on the above annual construction cost estimates, the alternatives would result in direct jobs and indirect jobs. The creation of jobs in the region is considered a benefit.

Although the construction activities associated with the Sediment TMDL would increase the economic opportunities in the area and region, this construction is not expected to result in or induce substantial or significant population or land use development growth because the majority of the new jobs that would be created by this construction are expected to be filled the existing surplus of unemployed persons in the area and region.

The second area of potential indirect growth inducement is through the removal of obstacles to growth. As discussed above, no obstacles exist to land use or to population growth in the watershed.

3.10.3 Unavoidable Significant Adverse Impacts

Section 15126.2(a)(b) of the CEQA Guidelines requires a discussion of the significant environmental effects and the significant environmental effects which cannot be avoided if the proposed project is implemented. Reasonable foreseeable methods of

compliance with the Basin Plan Amendment may have adverse significant impacts to historical, archaeological, and paleontological resources. Proposed projects that would occur as a result of the Basin Plan amendment that would have potentially significant impacts on historical, archaeological, and paleontological resources would be untaken at the discretion of lead agencies under their respective local and state regulatory framework. Project specific impacts and mitigation measures will be evaluated in environmental reviews specific to those projects. While potential significant impacts to historical, archaeological, and paleontological resources may be mitigated through this discretionary environmental review, specific mitigation measures for said projects is not available at the programmatic level, since specific projects are unknown at this time. Therefore, although likely avoidable and mitigate able, potential impacts to historical, archaeological, and paleontological resources are significant and unavoidable.

Section 15126.2(c) of the CEQA Guidelines requires a discussion of potential significant, irreversible environmental changes that could result from a proposed project. Examples of such changes include commitment of future generations to similar uses, irreversible damage that may result from accidents associated with a project, or irretrievable commitments of resources. Resources (materials, labor, and energy) to implement TMDL-related projects do not represent a substantial irreversible commitment.

Furthermore, implementation of the Sediment TMDL is both necessary and beneficial. To the extent that the alternatives, mitigation measures, or both, that are examined in this SED are not deemed feasible by the municipalities and agencies complying with the TMDL, the necessity of implementing the federally required TMDL and removing the significant environmental effects from sediment impairment in the Lagoon (an action required to achieve the express, national policy of the Clean Water Act) remains. In addition, implementation of the TMDL will have substantial benefits to water quality and will enhance beneficial uses. Enhancement of the recreational, estuarine, and areas of biological significance beneficial uses will have positive social and economic effects by improving saltmarsh and non-tidal saltmarsh habitat for both aesthetic enjoyment and biological utility.

3.11 Statement of Overriding Considerations and Findings

The proposed Basin Plan amendment would result in potentially significant impacts to historical, archaeological, and paleontological resources through reasonably anticipated methods of compliance. Although it is likely that potential impacts will be avoided and/or mitigated, specific mitigation measures cannot be identified as specific projects are not identified. Therefore the potentially significant impacts may occur and must be considered, for this programmatic evaluation, significant and unavoidable.

The San Diego Water Board staff has balanced the economic, legal, social, technological, and other benefits of this proposed Sediment TMDL against the unavoidable environmental risks in determining whether to recommend that the San Diego Water Board approves this project. Upon review of the environmental information generated for this project and in view of the entire record supporting the TMDL, staff has determined that the specific economic, legal, social, technological, and other benefits of

this proposed Sediment TMDL outweigh the unavoidable adverse environmental effects, and that such adverse environmental effects are acceptable under the circumstances.

The implementation of this Basin Plan amendment will result in improved water quality in the waters of the region and will have significant positive impacts to the environment (including restoration and enhancement of beneficial uses) and the economy over the long term. The implementation of the Basin Plan amendment will restore and protect the Lagoon for use and enjoyment by the people of the state. Enhancement of the recreational, estuarine, and areas of biological significance beneficial uses will have positive social and economic effects by improving saltmarsh and non-tidal saltmarsh habitat for both aesthetic enjoyment and biological utility.

This TMDL is required by law under section 303(d) of the federal Clean Water Act (CWA), and if this San Diego Water Board does not establish this TMDL, the US EPA will be required to develop a TMDL. The CWA requires states to establish a priority ranking for waters on the 303(d) list of impaired waters and to develop and implement TMDLs for these waters.[51] The impacts associated with US EPA's establishment of the TMDL would be significantly more severe, as discussed herein, because US EPA will not provide a compliance schedule and the final waste load allocations, pursuant to federal regulations, would need to be complied with upon incorporation into the relevant stormwater permits.[52] Since compliance would not be authorized over a period of years, all of the impacts associated with complying would be truncated into a short time frame, thus exacerbating the magnitude of the cumulative effect of performing all projects relatively simultaneously throughout the region.

Reasonable foreseeable methods of compliance may have adverse significant impacts to historical, archaeological, and paleontological resources. However, mitigation measures are available for each resource to reduce environmental impacts to less than significant levels. Reasonable foreseeable methods of compliance will be implemented by responsible jurisdictions and would therefore be subject to a separate, project-level environmental review. The lead agencies for the reasonable foreseeable methods of compliance projects have the ability to mitigate project impacts, can and should mitigate project impacts, and are required under CEQA to mitigate any environmental impacts they identify, unless they have reason not to do so. Notably, in almost all circumstances, where unavoidable or immitigable impacts would present unacceptable hardship upon nearby receptors or venues, the local agencies have a variety of alternative implementation measures available instead.

Implementation of the TMDL is both necessary and beneficial. To the extent that the alternatives, mitigation measures, or both, that are examined in this analysis are not deemed feasible by responsible agencies, the necessity of implementing the federally required TMDL and removing the sediment impairment from the Lagoon (an action required to achieve the express, national policy of the Clean Water Act) remains.

[51] 40 CFR 130.7
[52] 40 CFR 122.44(d)(1)(vii)(B).)

To the extent that future projects do not avoid or fully mitigate potential impacts, and the implemental of the Basin Plan amendment and this decision does not fully mitigate the adverse effects of those reasonably foreseeable projects, as discussed in greater detail above, the San Diego Water Board finds that overriding considerations of the greater public interest requires this action. Implementation of the Basin Plan amendment is in the greater public interest. The environmental, economic, and social benefits of implementing the Basin Plan amendment outweigh the potential adverse environmental effects that are not avoided or fully mitigated.

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